ORDER NO. VED9411197C1
D6

6539

Service Manual

Color Video Monitor

CT-S1390Y

G15M Chassis

The service technician is required to read and follow the "Safety Precautions" and "Important Safety Notice" in this service manual.

Specifications

Power Source: AC 120V, 60Hz

MAX Amps: 1.4A

Picture Tube: 13" Diagonal
90-degree deflection

Speaker Output: 1.5W (10% THD)

Video/Audio Terminals: (LINE A/LINE B)

Video Input; 1.0Vp-p, 75Ω or High impedance (Auto), BNC type connector

Video Through Out; Automatic Termination Opener, BNC type connector

Audio Input; 0.5Vrms, 22kΩ or more, phono type connector

Audio Through Out; Phono type connector

S-Video Input; Y signal 1.0Vp-p, C signal 0.285Vp-p, 75Ω or High impedance (Manual), MINI DIN 4P type connector

S-Video Output; Y signal 1.0Vp-p, C signal 0.285Vp-p, 75Ω or High impedance (Manual), MINI DIN 4P type connector

Resolution: 420 TV lines (Horizontal)

Dimensions:

Width; $14^{3}/_{8}$″ (365 mm)

Depth; $15^{15}/_{32}$″ (393 mm)

Height; $12^{17}/_{32}$″ (318.5 mm)

Weight: 28.2lbs. (12.8kg)

Operating Temperature: 32˚F~95˚F (0˚C~+35˚C)

Operating Humidity: 20%~80% (without dew on the surface of each parts)

Safety Regulations: UL1410 Listed

EMC Regulations: Complied with FCC rules, Part 15

Specifications are subject to change without notice.
Weight and dimensions shown are approximate.

Panasonic®

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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- **PRODUCT COMPLIES WITH DHHS RULES 21 CFR SUBCHAPTER J IN EFFECT AS OF DATE OF MANUFACTURE.**

IMPORTANT SAFETY NOTICE

There are special components used in Panasonic Monitor sets which are important for safety. These parts are shaded on the schematic diagram. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent X-RADIATION, shock, fire, or other hazards. Do not modify the original design without permission of PANASONIC BROADCAST & TELEVISION SYSTEMS COMPANY.

Safety Precaution

GENERAL GUIDELINES

1. It is advisable to insert an isolation transformer in the AC supply before servicing a hot chassis.
2. When servicing, observe the original lead dress, especially the lead dress in the high voltage circuits. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
3. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers, shields, and isolation R-C combinations, are properly installed.
4. Before turning the monitor on, measure the resistance between 130V line and hot side ground (TP92), between B+ line and cold side ground (TPA5). Connect the ⊖ side of an ohmmeter to the B+ lines, and the ⊕ side to ground (TPA5). Each line should have more resistance than specified, as follows:

B+Line	Minimum Resistance
130V (TP91)	10kΩ
5V (TPA2)	500Ω
9V (TPA3)	500Ω
11.1V (TPA6)	500Ω
17.3V (TPA7)	500Ω
24.5V (TPA8)	2kΩ
186V (TPA10)	100kΩ

5. When the monitor is not used for a long period of time, unplug the power cord from the AC outlet.
6. Potentials, as high as 24.5kV±1.5kV are present when this monitor is in operation. Operation of the monitor without the rear cover involves the danger of a shock hazard from the monitor power supply. Servicing should not be attempted by anyone who is not thoroughly familiar with the precautions necessary when working on high voltage equipment. Always discharge the anode of the picture tube to chassis ground before handling the tube.
7. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Turn on the monitor's power switch.
3. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the monitor, such as screwheads, connectors, control shafts, etc.
   When the exposed metallic part has a return path to the chassis, the reading should be more than 1MΩ.
   When the exposed metal does not have a return path to the chassis, the reading must be ∞.

LEAKAGE CURRENT HOT CHECK (See Fig. 1)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 1.5 kΩ, 10 watt resistor, in parallel with a 0.15 μF capacitor, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in Fig. 1.
3. Use a high impedance AC voltage meter to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 500μA. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the monitor should be repaired and rechecked before it is returned to the customer.

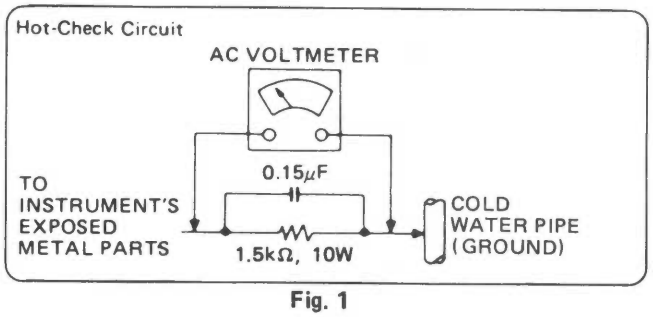


Fig. 1

X-RADIATION

WARNING:1. The potential source of X-Ray Radiation in monitor set is the High Voltage section and picture tube.

2. When using a picture tube test jig for service, make sure that the jig is capable of handling 26.0kV without causing X-Ray Radiation.

NOTE: It is important to use an accurate, periodically calibrated high voltage meter.

High Voltage Check

1. Set the line voltage to 120V AC and turn the unit on after connecting high voltage meter to the unit.
2. Select the Video Line A input and receive monoscope pattern.
3. Adjust Sub-Bright and Sub-Contrast until the picture is black.
4. Measure the High Voltage. The meter (electrostatic type) reading should indicate 24.5kV ± 1.5kV. If the meter indication is out of tolerance, immediate service and correction is required to prevent the possiblity of premature component failure.
5. To prevent an X-Radiation possibility, it is essential to use the specified picture tube.

Radiation Safety Circuit Test

This test must be made as a final check before the set is returned to the customer.

(1) Connect DC amperemeter to TPD1 (+) and TPD2 (−).
(2) Connect Electrostatic high voltage meter between the CRT anode and chassis ground for measuring high voltage.
(3) Set AC line to 120V/60Hz, and apply a monoscope pattern at the line B, adjust BRIGHT and CONTRAST customer controls to obtain 700±100μA indication on DC amperemeter.
(4) Turn chassis off, and short R802 with a short jumper.
(5) Set AC line to about 80 volts, and turn chassis on. Slowly increase the AC line voltage until the start point of lose of H-SYNC on the picture and check that the beam current and the high voltage is A or B in Table 1 at the point.
(6) Turn chassis off and remove a short jumper.

Table 1

	Beam Current (μA)	High Voltage (kV)
A	400~600	not exceeding 28
B	601~800	not exceeding 27.6

Circuit Explanation

HORIZONTAL OSCILATOR DISABLE CIRCUIT

To monitor the high voltage, the positive DC voltage from the cathode of D531 is applied through zener diode D571 and D572 and divided by R532 and R533 to pin 49 of IC301, which is the input terminal of the X-Ray Protection Circuit.

Under normal conditions, this voltage is insufficient to activate the X-Ray Protection Circuit.

If the high voltage increase over the specified voltage, the voltage at the pin 49 of IC301 increases and causes the X-Ray Protection Circuit to activate. Then it causes the horizontal oscillator frequency to increase, loss of holizontal synchronization and lowering of the high voltage.

In the process described above, the voltage at the pin 49 of IC301 is compared with the voltage at pin 51 of IC301 which is basically a constant voltage fed from the zener diode D532, divided by R539 and R535. If excessive beam current is drawn, the lowered voltage is fed to pin 51 of IC301 through zener diode D570 and R534 to aid operation of the X-Radiation Protection Circuit.

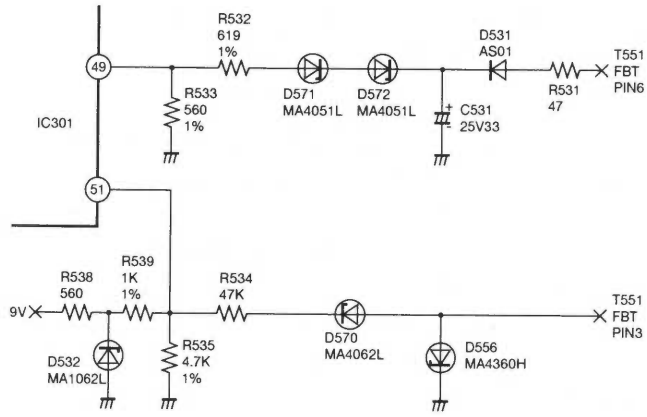
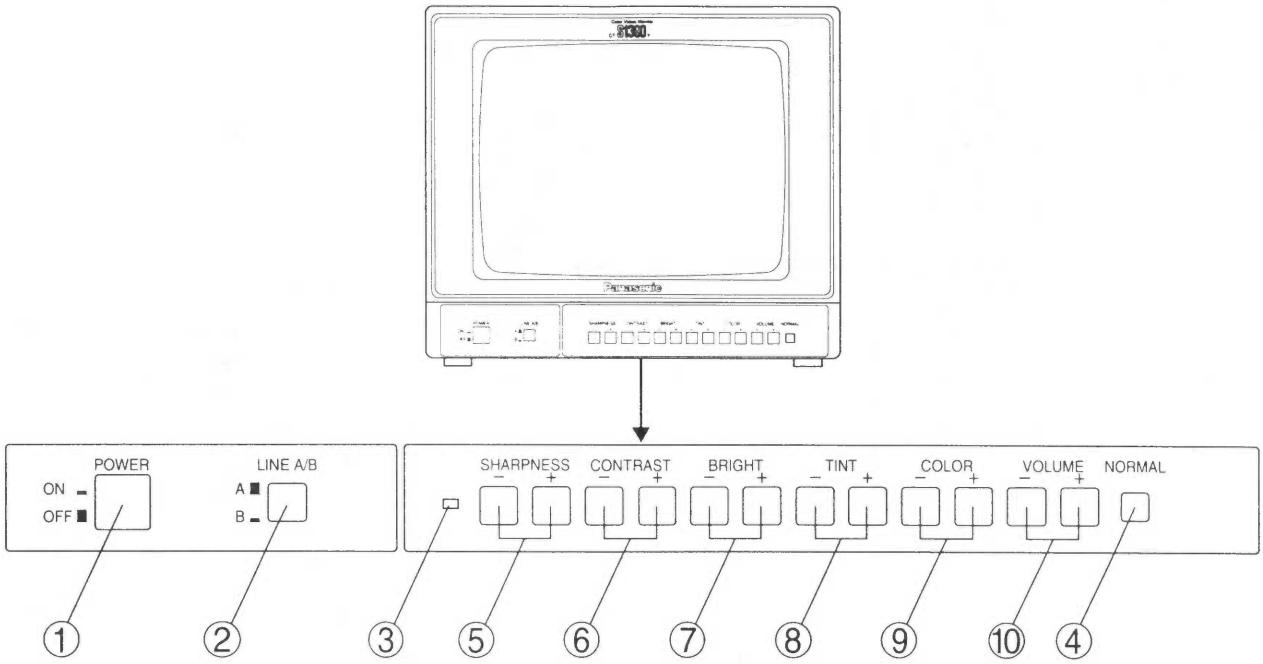


Fig. 2

Operation of Front Panel Controls

First, turn on the device connected to the monitor.
If the monitor does not light up, it means that the signal is not being input to it.



① Power Switch

Power ON/OFF.

ON OFF

② Input Selector

This switch is used to select one of the two signal inputs (LINE A and LINE B).

LINE A LINE B

③ Operation Indicator

- This indicator lights up when the power is ON.
- This indicator flashes while you are pressing the +/– buttons on one of the controls, and lights up when the control value in question reaches Min./Max.
- This indicator flashes twice when the Normal Button is pressed.

④ Normal Button

This button is used to return the picture control level to the factory set mid values.

⑤ Sharpness Control

SHARPNESS
Soft – + Sharp

⑥ Contrast Control

CONTRAST
Decrease – + Increase

⑦ Brightness Control

BRIGHT
Dark – + Bright

⑧ Tint Control

TINT
Red – + Green

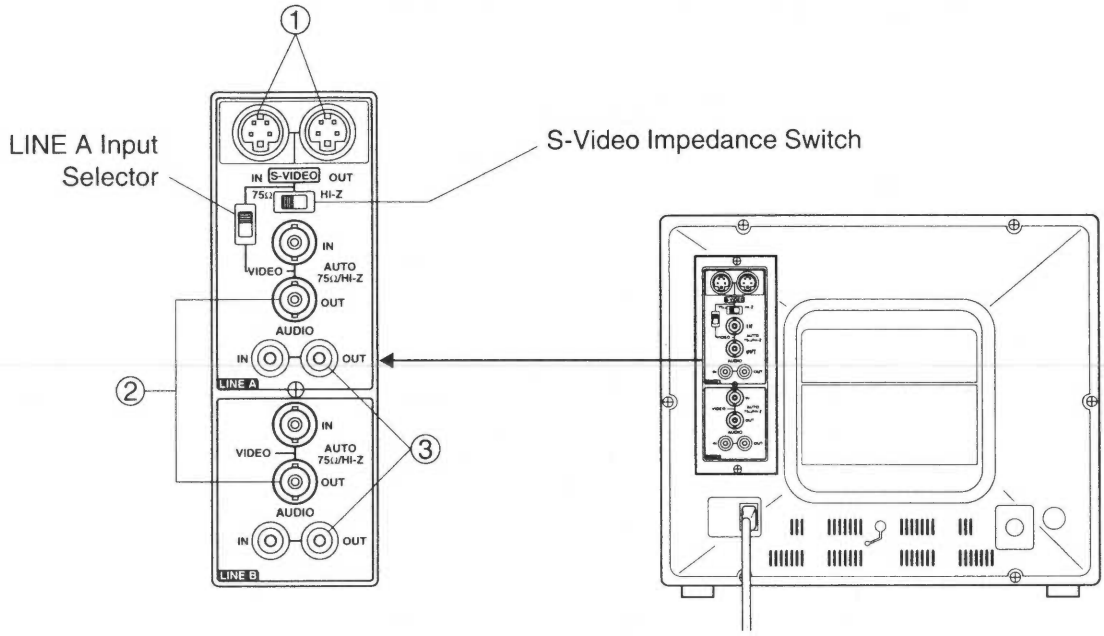
⑨ Color Control

COLOR
Low Color – + High Color

⑩ Volume Control

VOLUME
Min. – + Max.

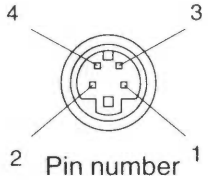
Rear Terminals



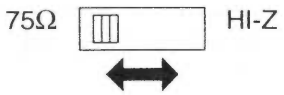
Signals received	Switches	Input Selector (LINE A/B at front panel)	LINE A Input Selector (at rear terminals)
LINE A	S-Video	■	↑
	Video	■	↓
LINE B	Video	▬	

① **S-Video Input/Output Terminal** (4 pin)

These are the luminance signal and chroma signal input/output terminals.
When connecting the output terminal to another device, set the S-Video Impedance Switch to HI-Z, and set the Input Selector to the LINE A position.



Pin No.	Function
1	GND (Luminance)
2	GND (Chroma)
3	Luminance
4	Chroma



② **Video Input/Output Terminals** (BNC)

Note: To view the LINE A Video Input Signal (instead of S-Video), set the LINE A Input Selector at the bottom.

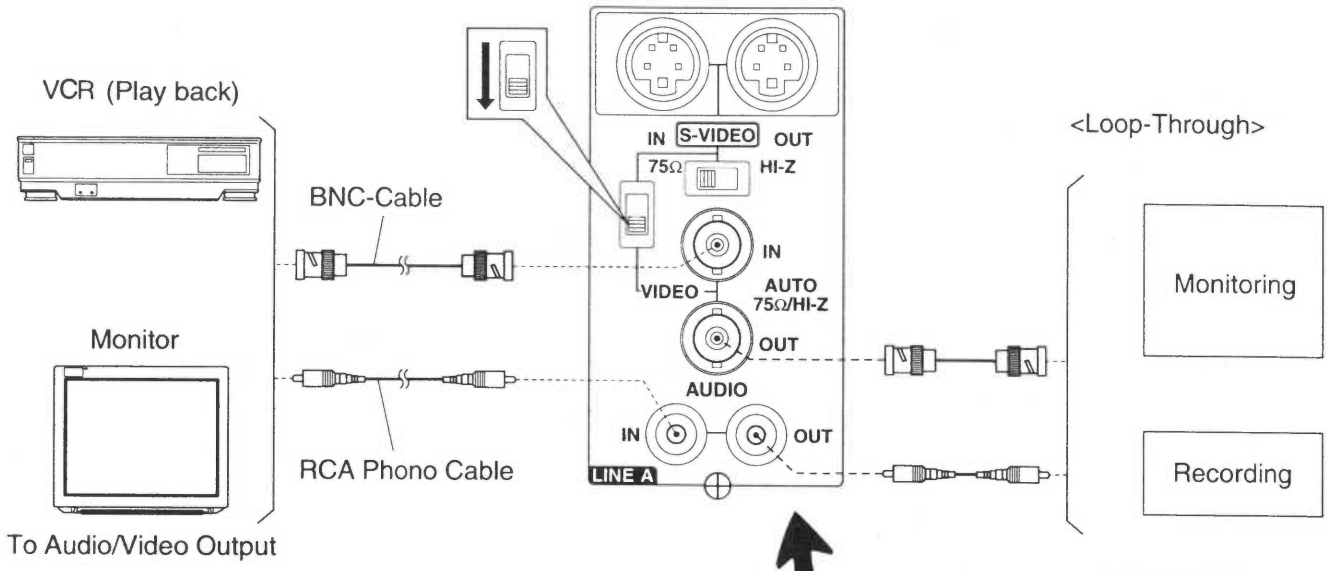
③ **Audio Input/Output Terminals** (RCA phono)

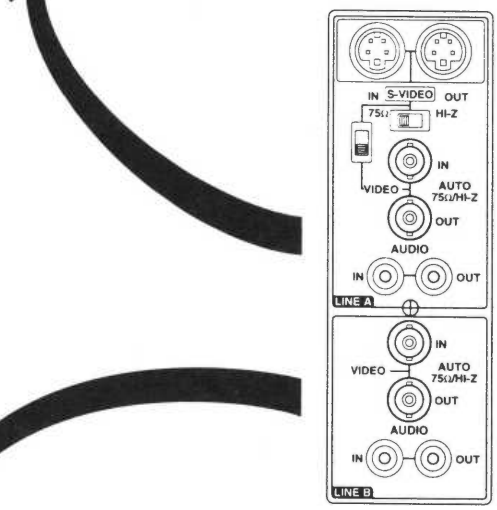
Note: The signal to each output terminal is supplied through each signal of LINE A or LINE B signal regardless of the setting position of the Input Selector or the LINE A Input Selector.

Connections

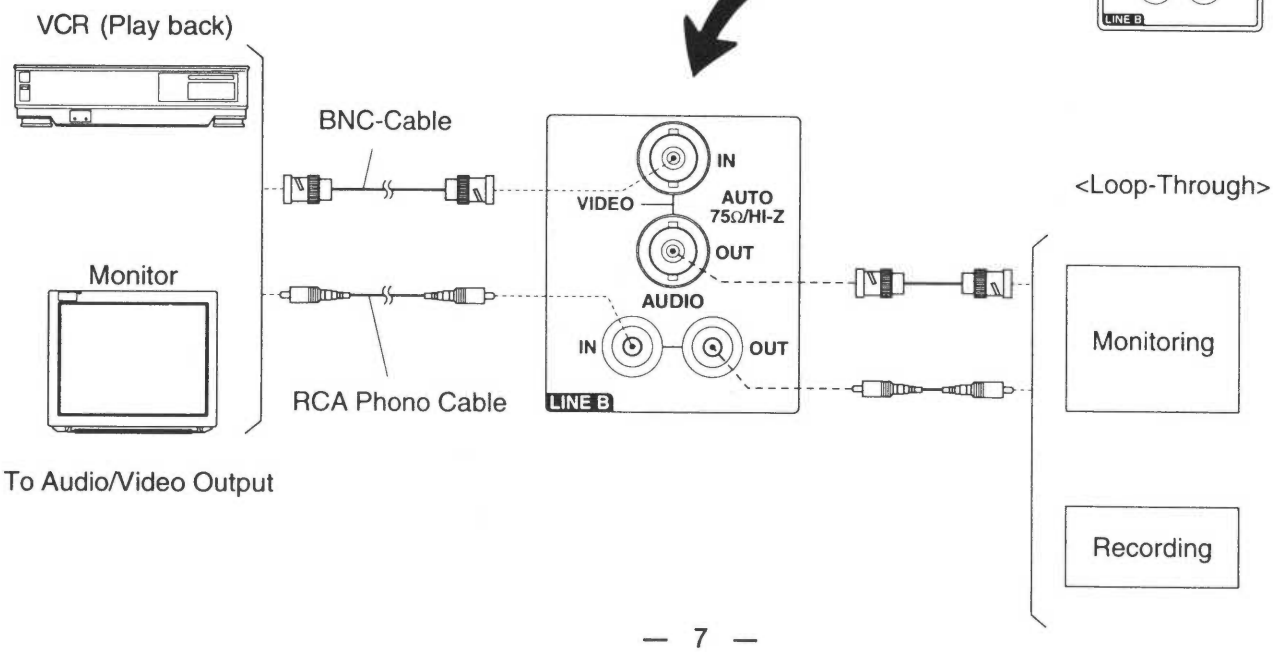
1. Video (BNC) Terminal

Line A



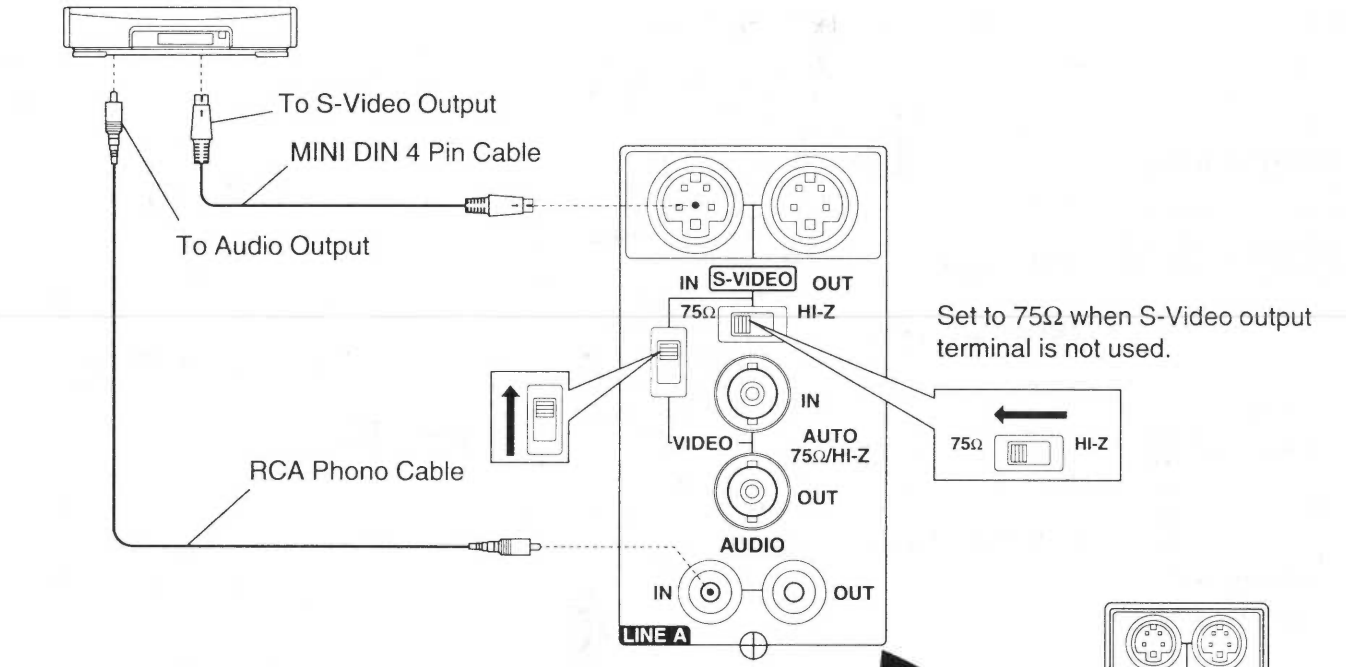


Line B



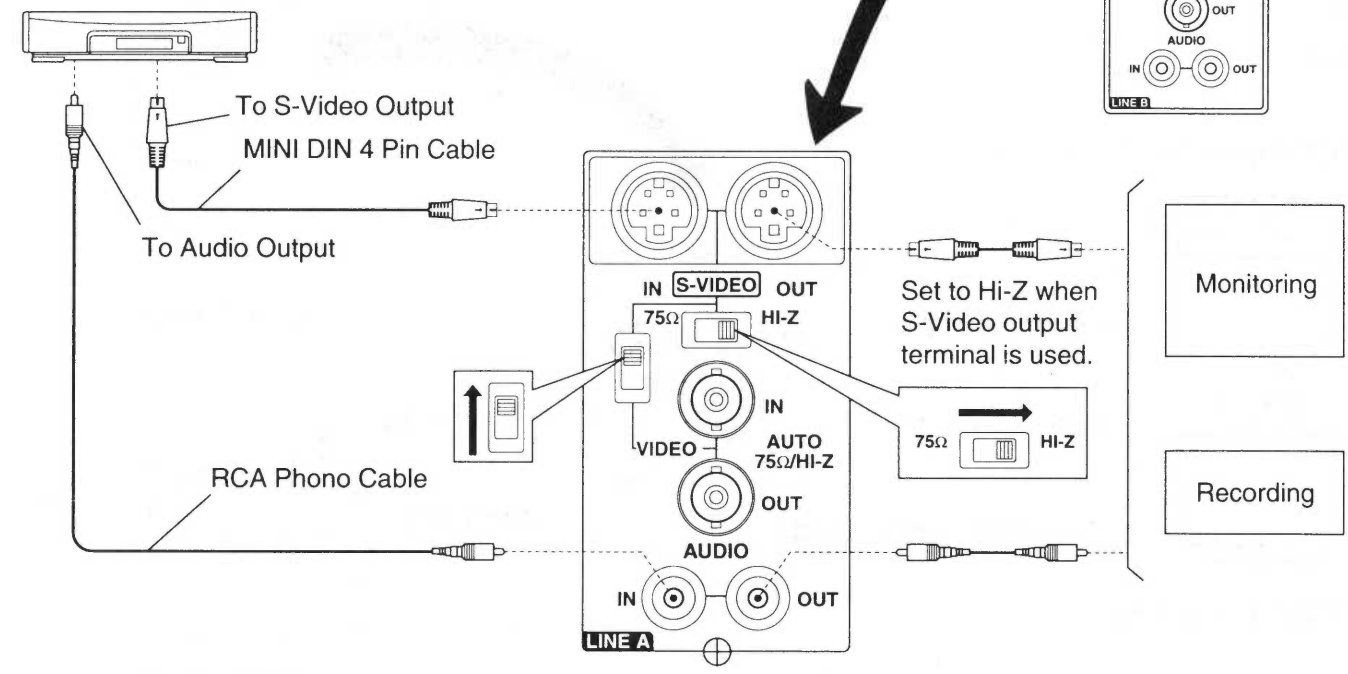
2. S-Video Terminal

VCR with S-VIDEO terminal



S-Video Loop-Through

VCR with S-VIDEO terminal



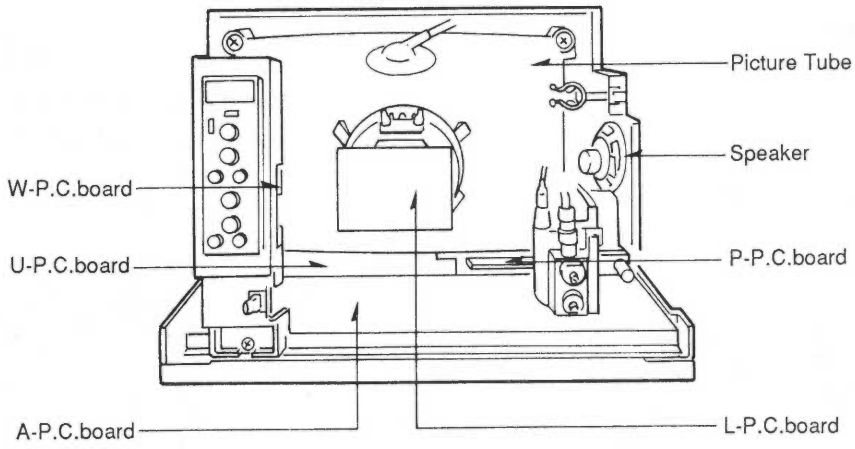
Disassembly Instructions

Warning:

1. Before disassembly, remove the AC plug from the wall outlet.
2. When turning over a P.C.board to adjust it, be sure to lay on insulating material under it in order to prevent shorting.
3. P.C.board and wires should not be pulled forcibly, but be handled carefully.
4. When removing the cabinet take care not to damage the neck of the picture tube.
5. P.C.boards and connectors should be handled with care-avoid handling them forcibly!
6. When handling the A-P.C.board with the power on, there is a risk of an electric shock if you use the COLD side heat sink while working on the HOT side of the chassis.

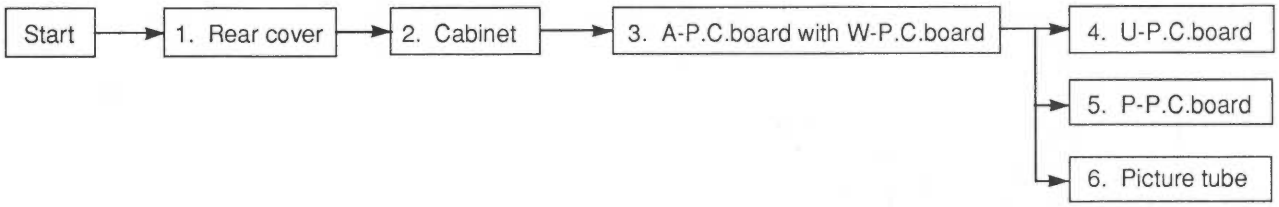
CIRCUIT BOARD LAYOUT

(Rear View)



DISASSEMBLY FLOWCHART

This flowchart indicates disassembly items of the cabinet parts and circuit boards in order to find the items necessary for servicing. When reassembling, perform the steps in the reverse order.



DISASSEMBLY INSTRUCTION

1. Removal of Rear cover

1. Remove 9 screws(A).

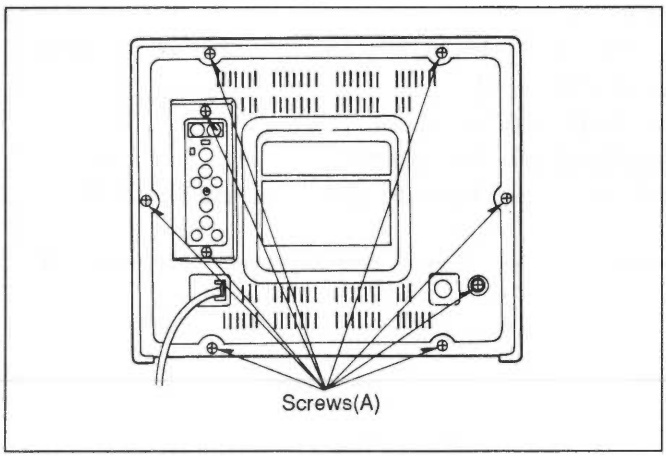


Fig.1

2. Removal of Cabinet

1. Remove 8 screws(B).
   (Right side:4, Left side:4)

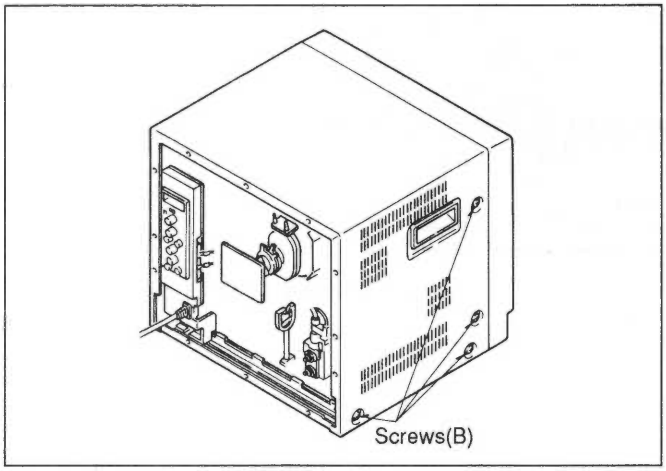


Fig.2

3. Removal of A-P.C.board with W-P.C.board

1. Remove 2 screws(C) of the frame.
2. Remove a screw(D) for earth.
3. Remove the DEG connector and clampers.
4. Slide the frame toward you.

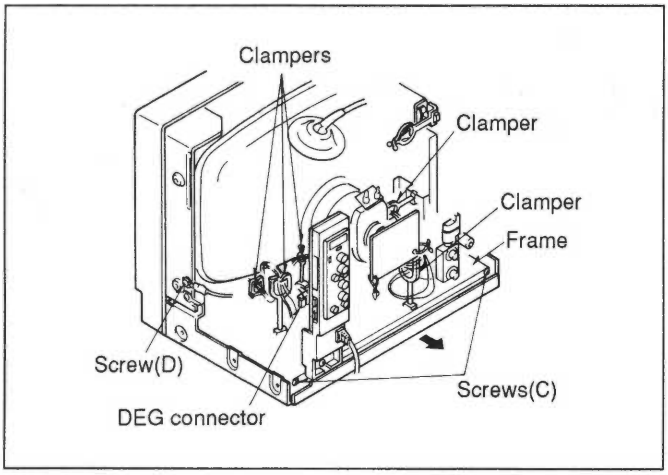


Fig.3

4. Removal of U-P.C.board

1. Remove 7 screws(E).

5. Removal of P-P.C.board

1. Remove 2 screws(F) as shown in fig.4.

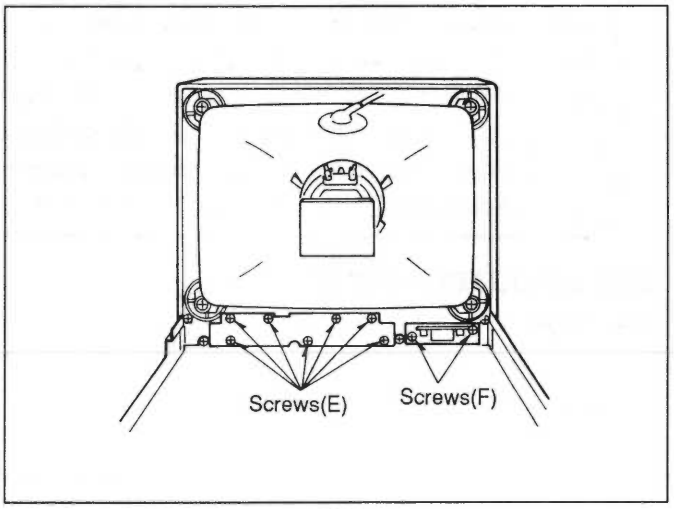


Fig.4

6. Removal of Picture tube

1. Remove the L-P.C.board and the deflection yoke.
2. Remove 4 screws(G).

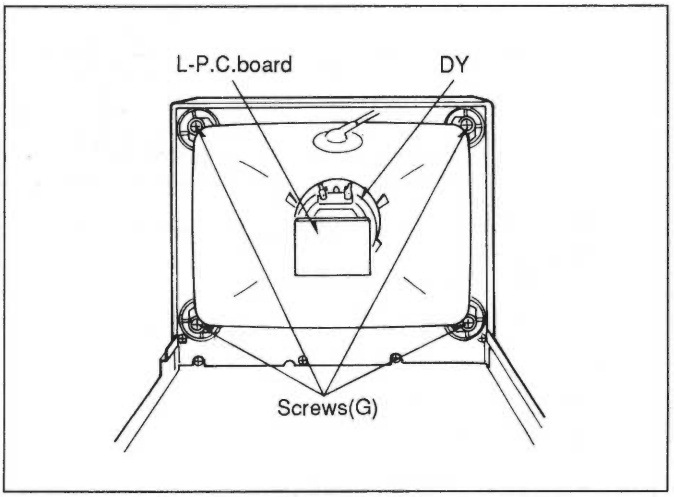


Fig.5

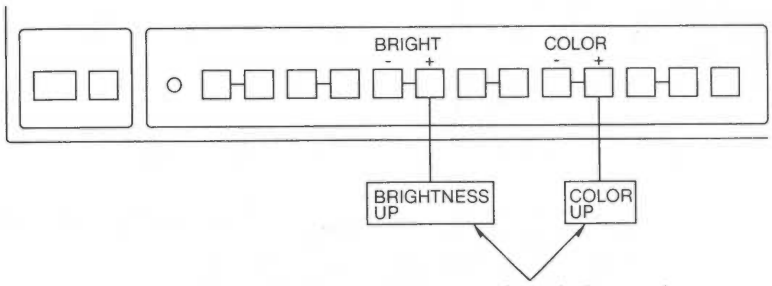
Self Check Functions

If you cannot confirm the "occasional power cut-off" symptom during servicing, use the self check function to deter mine whether or not this problem occurs.

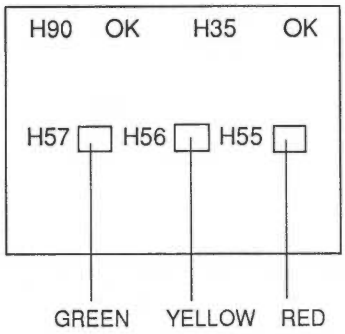
Method

Simultaneously press the "Color Up" and "Brightness Up" buttons on the front panel of the unit for approximately 2 seconds.

The Self Check panel will be displayed.



Press simultaneously for approximately 2 seconds.



Item	Check Circuit / Component Name
H90	Communication abnormality between the microprocessor (IC001) and the memory (IC002).
H35	Communication abnormality between the microprocessor (IC001) and the video chroma jungle circuit (IC301).
H55	Abnormal detect of voltage or load on each positive voltage lines.
H56	The differences between the three displays depend on the differing voltage values in pin 19 (or TPA9) of IC001.
H57	H55 . . . 3.7 V or more, H56 . . . less than 3.6 V , H57 . . . less than 2.3 V.

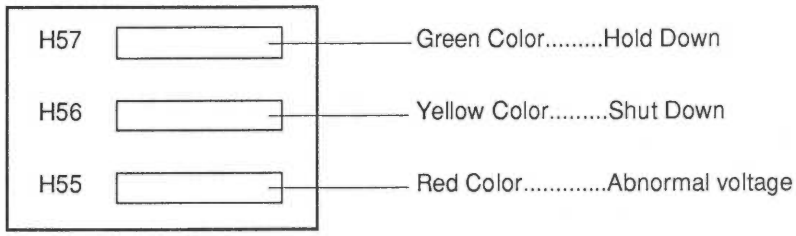
Note: There will be no display unless H55, H56 or H57 are abnormal.

Cancel

Turn the power off. In this case the selfÐcheck results will have to be reset.

Display when "Power Off" occurs.

The screen color bar will be displayed when the protective circuit turns on because of excess current, excess voltage or abnormal voltage.



Concerning Market Service Mode

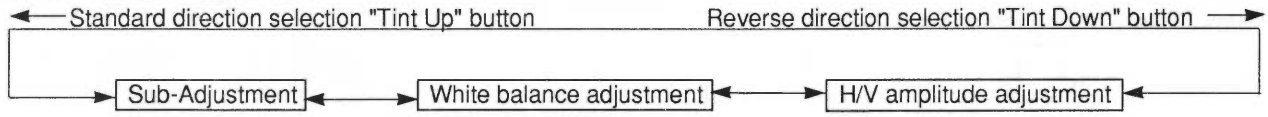
The unit has a market service mode by which variqus adjustments can be made through manipulating the buttons on the front panel.

Item Check Circuit / Component Name

Starting Market Service Mode

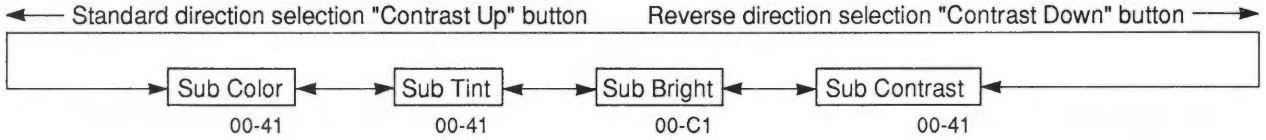
Press the "Color Up" and the "Sharpness Up" buttons on the front panel simultaneously for two seconds.

Content of Market Service Mode

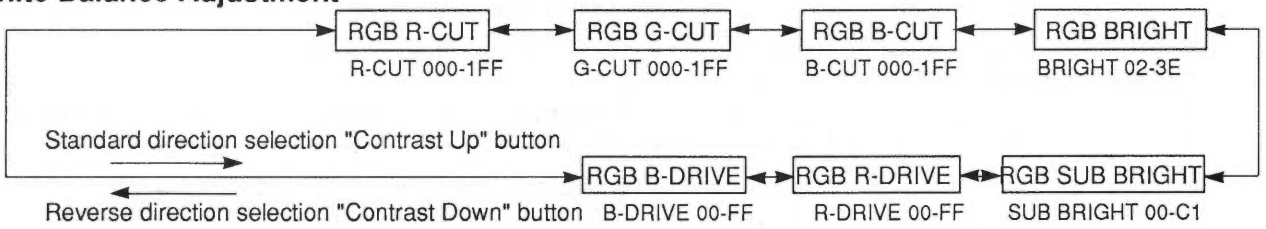


Values written are displayed in hexadecimal.

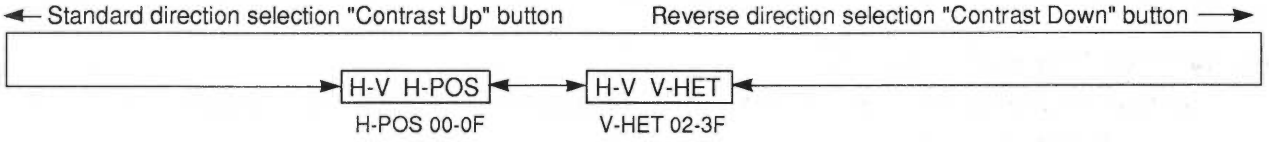
Sub Adjustment



White Balance Adjustment



H/V amplitude adjustment



Note: Each adjustment is made using the Volume + / -.

Caution:

The values (hexadecimal) preset in the market service mode differ between TV sets. For this reason when you enter the market service mode perform adjustment work after writing down the values of each item.

When Adjusting the Market Service Mode is Necessary

Adjustment Always Necessary

A. After the memory has been replaced.
B. When the picture tube has been replaced.

Verify the Crosshatch Pattern and Adjust When Necessary

A. After deflecting coil circuit components have been replaced.
(for example the vertical output IC, the deflection yoke, the Q551 and the flyback transformer.

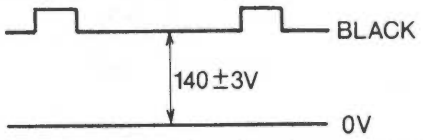
Adjustment Method

SUB Adjustment

Adjustment is not necessary.

White Balance Adjustment

1. Apply white balance pattern (with burst) at the LINE A (video).
2. Adjust R, G, B-Cut to 0FF.
3. Apply the sub-bright adj. mode, and connect short jumper to TPS8-GND, and turn screen VR to fully counter-clockwise.
4. Observe TPKG by oscilloscope. Then adjust sub-bright so that the scanning period get 140±3V DC. Remove the probe of oscilloscope.
   Note: Adjust sub-bright in sub volume adj. mode.
   (Sub-bright in white balance adj. mode can not last memory.)



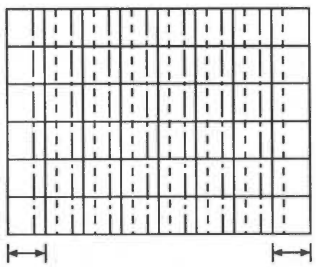
5. Turn screen VR to clockwise slowly and set it where first color is slightly appeared, and remove the short jumper.
6. Then make above low light to white by changing the data for R-cut and B-cut.
7. Obtain proper white balance by changing the data for R-drive and B-drive.
8. Place the light reception hood of the white balance meter on the CRT face glass.
9. Perform low-light adj. with the white balance meter switched to LO.
   (9300°K±300°K)
10. Perform high-ligh adj. with the white balance meter switched to HI.
    (9300°K±300°K)
11. Repeat the above two adj. item 9 and 10 to correct the low-light adj.
12. Low-light adj. shall be carried out last because low-light adj. has less effect on high-light adj. than vice-versa.

H-V (Horizontal, Vertical Adjustment)

Initialize Condition: Receive the cross hatch pattern.

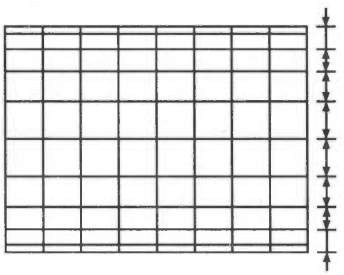
H-POS (horizontal position) Adjustment

Press the Volume + / - bottons and adjust so that the vertical lines on the left and right of the cross hatch pattern are equidistant from the screen margins.



V-HET (Vertical Amplitude) Adjustment

Press the Volume + / - bottons and adjust so that the vertical size of the cross-hatch pattern measures are the same (adjust so that they are the same as the horizontal line intervals).



Measurements and Adjustments

CAUTION FOR SERVICING

This model has the HOT and COLD section with the power supply section. Therefore following precautions are necessary.

1. Do not touch the HOT section and the COLD section at the same time. You may receive an electric shock.
2. Do not short the HOT section to the COLD section. This could blow the fuse or even damage parts.
3. Never measure the HOT section and the COLD section at the same time when using tools such as oscilloscopes or multimeters.
4. Always unplug the unit before beginning any operation such as removing the chassis.
5. For each adjustment, when a connector or a short jumper is connected or disconnected, first set the power switch to the OFF position.

Unless otherwise noted, a transformer core with two tuning peak points should be adjusted at the lower position as shown in below Fig. 1.

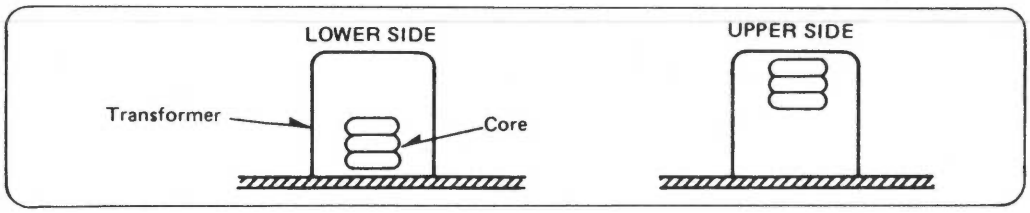


Fig. 1

+B VOLTAGE ADJUSTMENT (A-P.C. board)

1. EQUIPMENT TO USED

Digital Voltmeter
Tuner Unit.

2. ADJUSTMENT PROCEDURE

1. Set the Brightness and Contrast control to minimum, and delete the raster.
2. Connect a Digital Voltmeter between each +B points and the ground as shown in Table 1.
3. Confirm that the indicated measurement points for the specificated voltage.

Table 1

+B Points	GND Points	Voltage
TP91	TP92 (HOT GND)	130±2V
TPA2	TPA5 (COLD GND)	5±1V
TPA3		9±1V
TPA6		11.1±1V
TPA7		17.3±2V
TPA8		24.5±2V
TPA10		186±15V

PURITY ADJUSTMENT

1. EQUIPMENT TO USED

Video Generator
External Degaussing Coil

2. ADJUSTMENT PROCEDURE

1. Operate the monitor over 30 minutes.
2. Fully degauss the picture tube by using an external degaussing Coil.
3. Set the Input Selector Switches to LINE A.
4. Input a cross hatch pattern to VIDEO input terminal.
5. Adjust roughly convergence by using the static and convergence magnets and deflection yoke.
6. Input a black and white signal to VIDEO input terminal.
7. Loosen clamp screw of the deflection yoke.
8. Slide the deflection yoke toward the picture tube by activating green only.
9. Adjust the purity magnets so that green bar is obtained at the center of the picture.

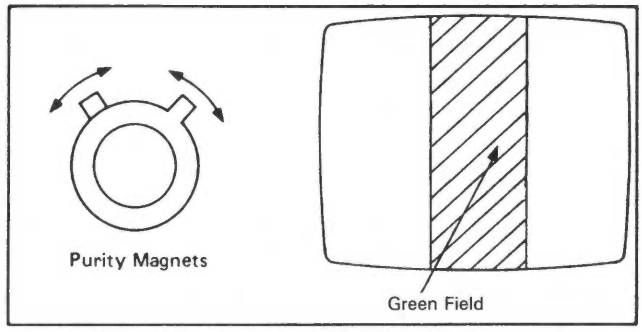


Fig. 2

10. Slide the deflection yoke toward you so that good purity is obtained.
11. Confirm the purity with a red and a blue screen.
12. Emit the Red, Green and Blue at the same time.
13. Confirm the white quality.
14. Tighten clamp screw when complete.

CONVERGENCE ADJUSTMENT

1. EQUIPMENT TO USED

Video Generator.

2. ADJUSTMENT PROCEDURE

1. Operate the monitor 30 minutes.
2. Set the Input Selector Switches to LINE A.
3. Input a Cross Hatch patten signal to VIDEO input terminal.
4. Match the R and B at picture center with four pole magnet.
   (Rotate the two ring magnets to move the red and blue dots Circularly in the opposite derection).
5. At the picture center, match R and B to G with the six-pole magnet.

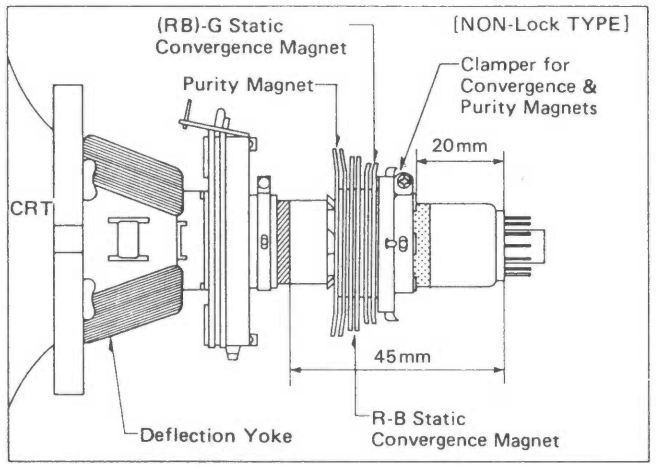


Fig. 3

6. Tilt the DY up and down, match the R and B for H line of center. (Fig. 4)
7. Tilt the DY left and right, match the R and B for H line of up and down side and V line of left and right side. (Fig. 5)

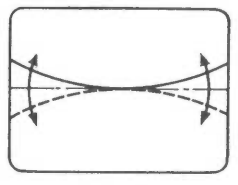


Fig. 4

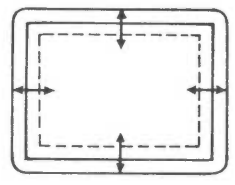


Fig. 5

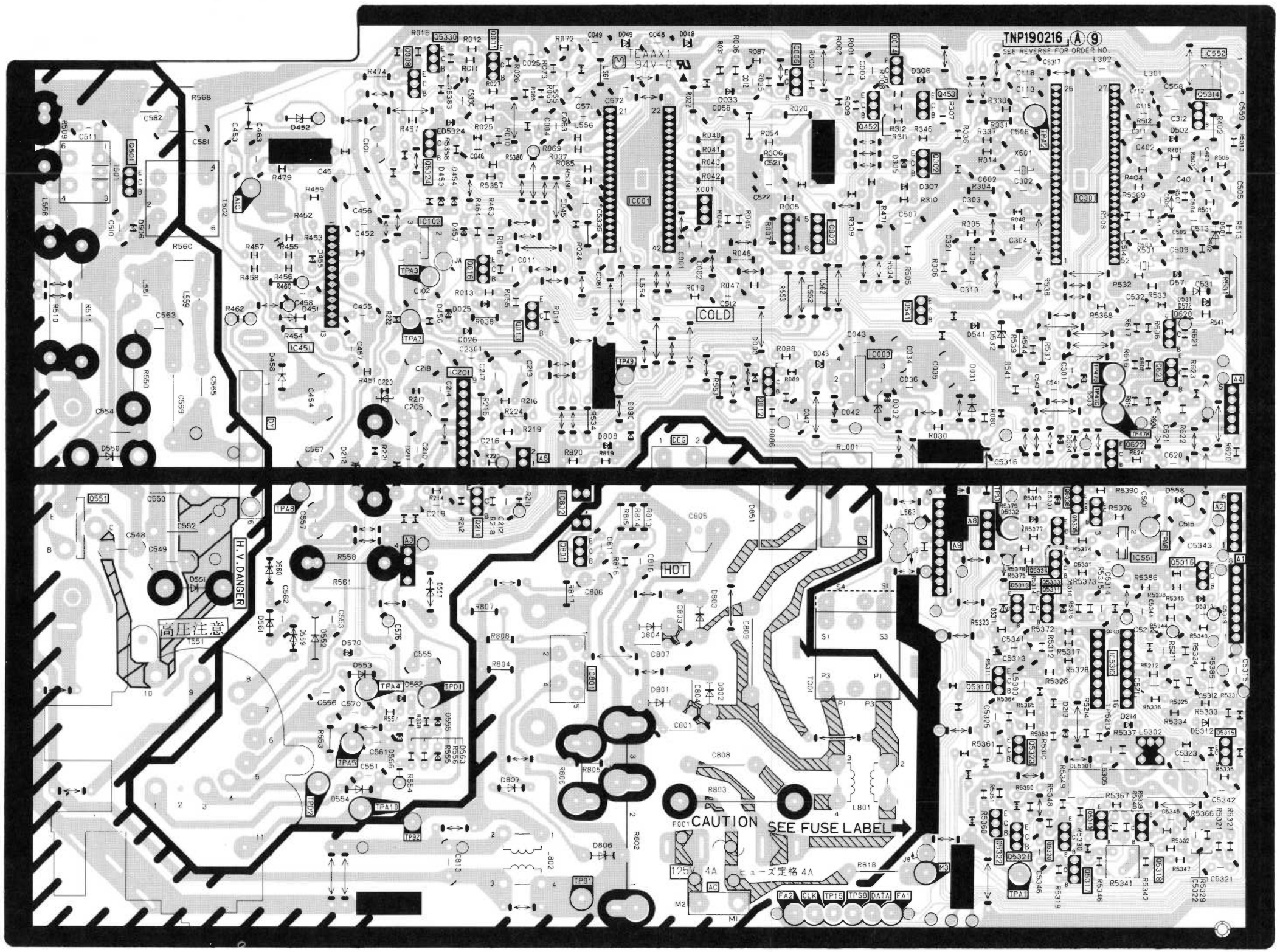
8. When the periphery convergence is bad, fix the good point for convergence by inserting parmalloy.

FOCUS ADJUSTMENT

Adjust the focus control (on the FBT) to obtain the sharpest and clearest picture.

Circuit Boards

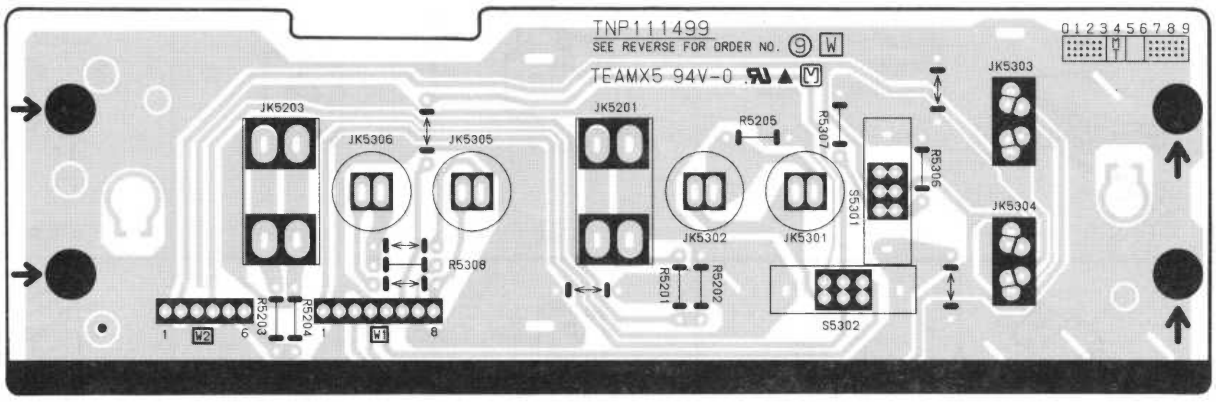
A-P.C. board TNP190216ZA



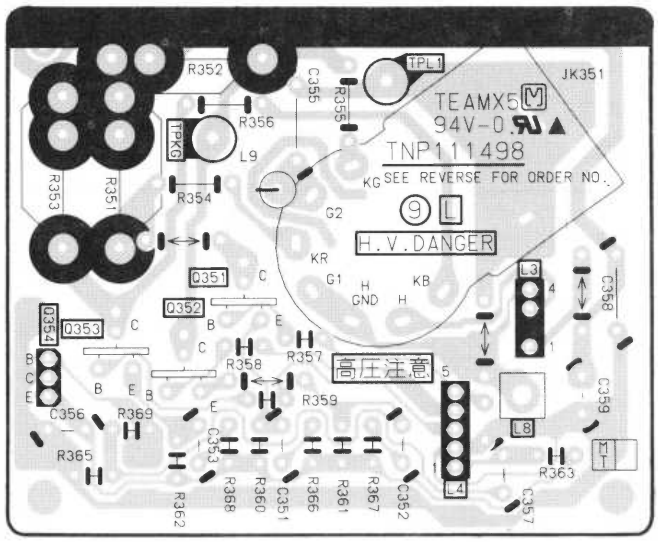
A-P.C. Board			
IC		Q5319	A-7
IC001	E-4	Q5320	A-6
IC002	E-5	Q5321	A-6
IC003	D-5	Q5322	A-6
IC102	E-3	Q5323	B-6
IC201	D-3	Q5324	E-3
IC301	E-7	Q5330	F-3
IC451	D-1	Q5333	C-6
IC551	C-7	Q5334	C-6
IC552	E-7	Q5335	C-7
IC801	B-4	Q5336	C-7
IC802	C-4	**VR**	
IC5310	B-7	R5341	A-7
TRANSISTOR		**TP**	
Q001	F-3	TPA1	A-6
Q006	E-5	TPA2	E-6
Q008	F-3	TPA3	D-3
Q012	D-5	TPA4	B-3
Q013	D-4	TPA5	B-3
Q014	F-6	TPA6	C-7
Q016	D-3	TPA8	C-2
Q211	C-3	TPA9	D-4
Q302	E-6	TPA10	A-3
Q452	E-5	TPD1	B-3
Q453	E-6	TPD2	B-2
Q501	E-1	TP13	C-6
Q541	D-6	TP47R	D-7
Q551	C-1	TP47G	D-7
Q620	D-7	TP47B	D-7
Q621	D-7	TP91	A-4
Q622	C-7	TP92	A-3
Q801	C-4	TP15	A-5
Q5310	B-6	FA1	A-5
Q5311	C-6	FA2	A-5
Q5313	C-6	CLK	A-5
Q5314	E-7	TPS8	A-5
Q5315	B-7	DATA	A-5
Q5316	C-7	A10	E-1
Q5317	A-7		
Q5318	A-7		

ADDRESS INFORMATION

W-P.C. board TNP111499



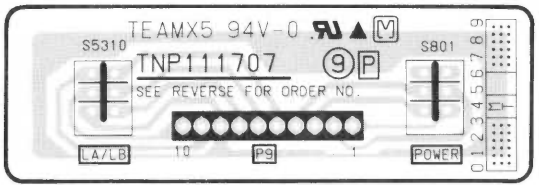
L-P.C. board TNP111498ZA



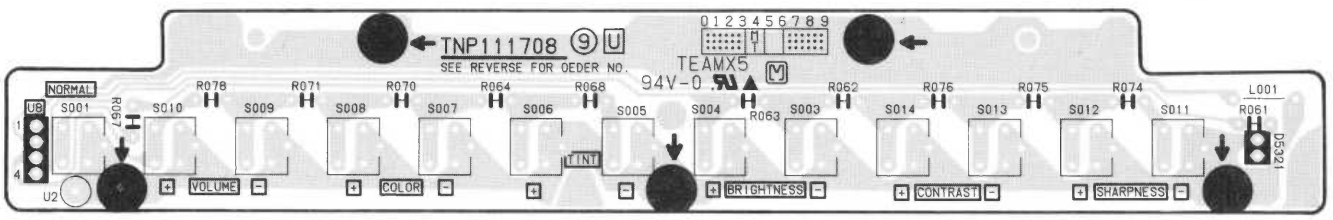
L-P.C. Board	
TRANSISTOR	
Q351	C-1
Q352	C-1
Q353	C-1
Q354	C-1
TP	
TPKG	D-1
TPL1	D-2

ADDRESS INFORMATION

P-P.C. board TNP111707



U-P.C. board TNP111708ZA



Terminal Guide of IC's, Transistors and Diode

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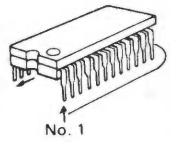
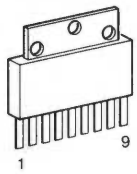
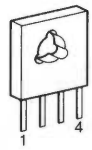
<td colspan="2"> 

AN5163K : 52 Pin
MN152811HYG : 42 Pin
TC4053BP : 16 Pin
µPD6263CX : 8 Pin</td>
<td> 

AN5265</td>
<td> 

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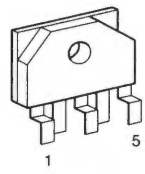
<td> 

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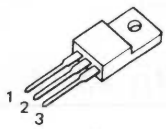
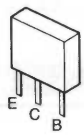
<td> 

AN78M09LB
AN78M10LB
AN78M05LB</td>
<td> 

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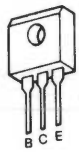
2SA1309AQR</td>
<td> 

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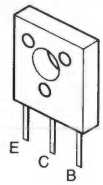
2SA1767QTA</td>
<td> 

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 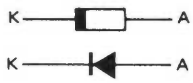
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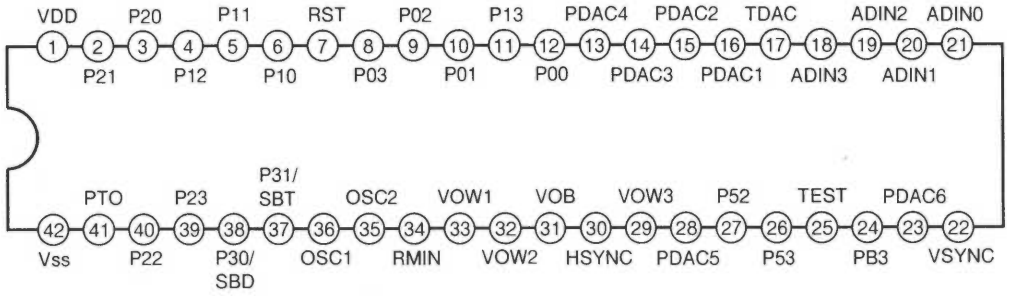
IC Function of Terminal and Equivalent Circuit

IC001 MN152811HYG

Pin No.	Mark	I/O	Function
1	VDD	I	Supply +5V.
2	P21	I	TV/AV select. Line A: H
3	P20	O	LED control.
4	P12	--	Not used.
5	P11	O	Audio defeat control. Defeat: H Normal: L
6	P10	O	Line A/B select. Line A: H Line B: L
7	RST	I	Reset terminal.
8	P03	--	Not used.
9	P02	--	Not used.
10	P01	--	Not used.
11	P13	I	BPF/DL select.
12	P00	O	Relayoutput. CRT ON: H CRT OFF: L
13	PDAC4	--	Not used.
14	PDAC3	--	V size output.
15	PDAC2	--	Not used.
16	PDAC1	O	Audio DAC output.
17	TDAC	--	Not used.
18	ADIN3	I	Key input 2.
19	ADIN2	I	SOS input.
20	ADIN1	I	Key input 1.
21	ADIN0	--	Ground.
22	VSYNC	I	V pulse for onscreen.
23	PDAC6	--	Not used.
24	PB3	O	Video defeat control. Defeat: H Normal: L
25	TEST	--	Ground.
26	P53	I	SYNC.input.
27	P52	I	IIC control input.
28	PDAC5	--	Not used.
29	VOW3	O	Character output.(B OUT)
30	HSYNC	I	H pulse for onscreen.
31	VOB	O	Character output.(BLK OUT)
32	VOW2	O	Character output.(G OUT)
33	VOW1	O	Character output.(R OUT)
34	RMIN	I	Fixed at H.
35	OSC2	I	6MHz oscillation input.
36	OSC1	O	6MHz oscillation input.
37	P31/SBT	O	Serial clock output.
38	P30/SBD	O	Serial data output.
39	P23	--	Ground.
40	P22	I	Fixed at H.
41	PTO	O	Not used.
42	Vss	--	Ground.

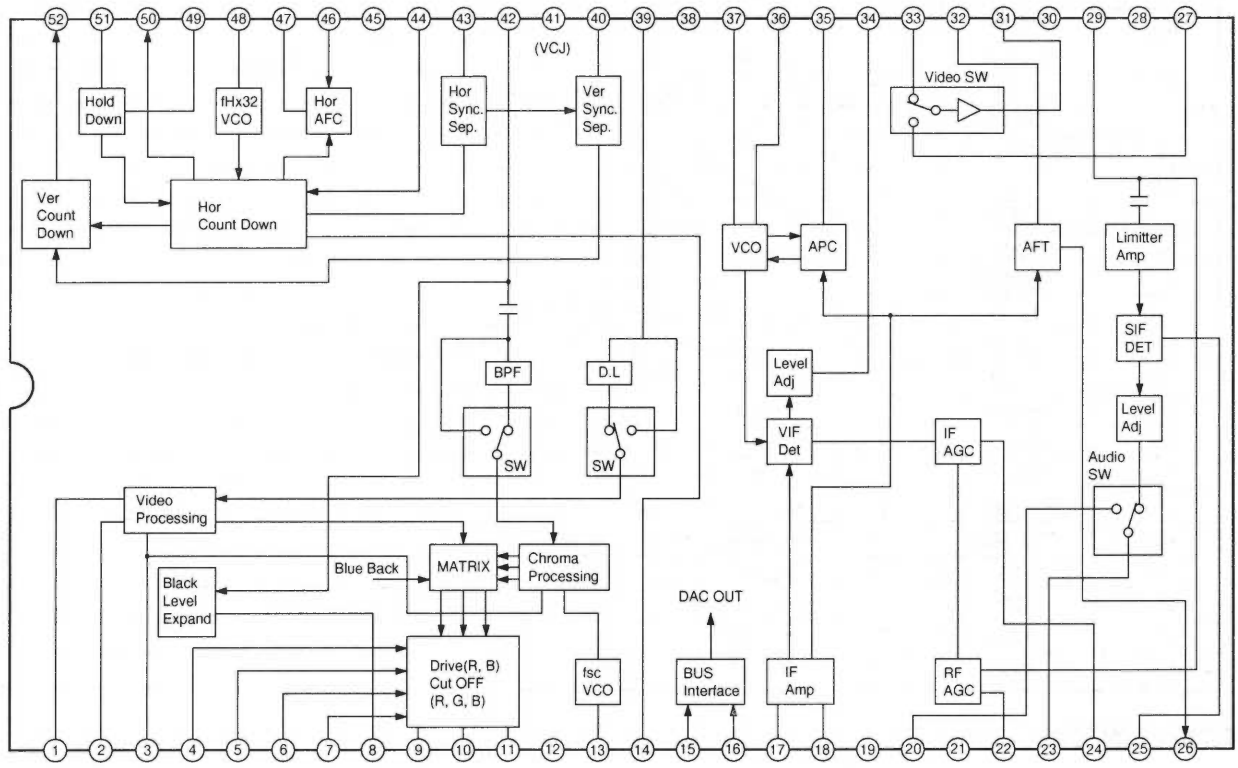
IC001 MN152811HYG

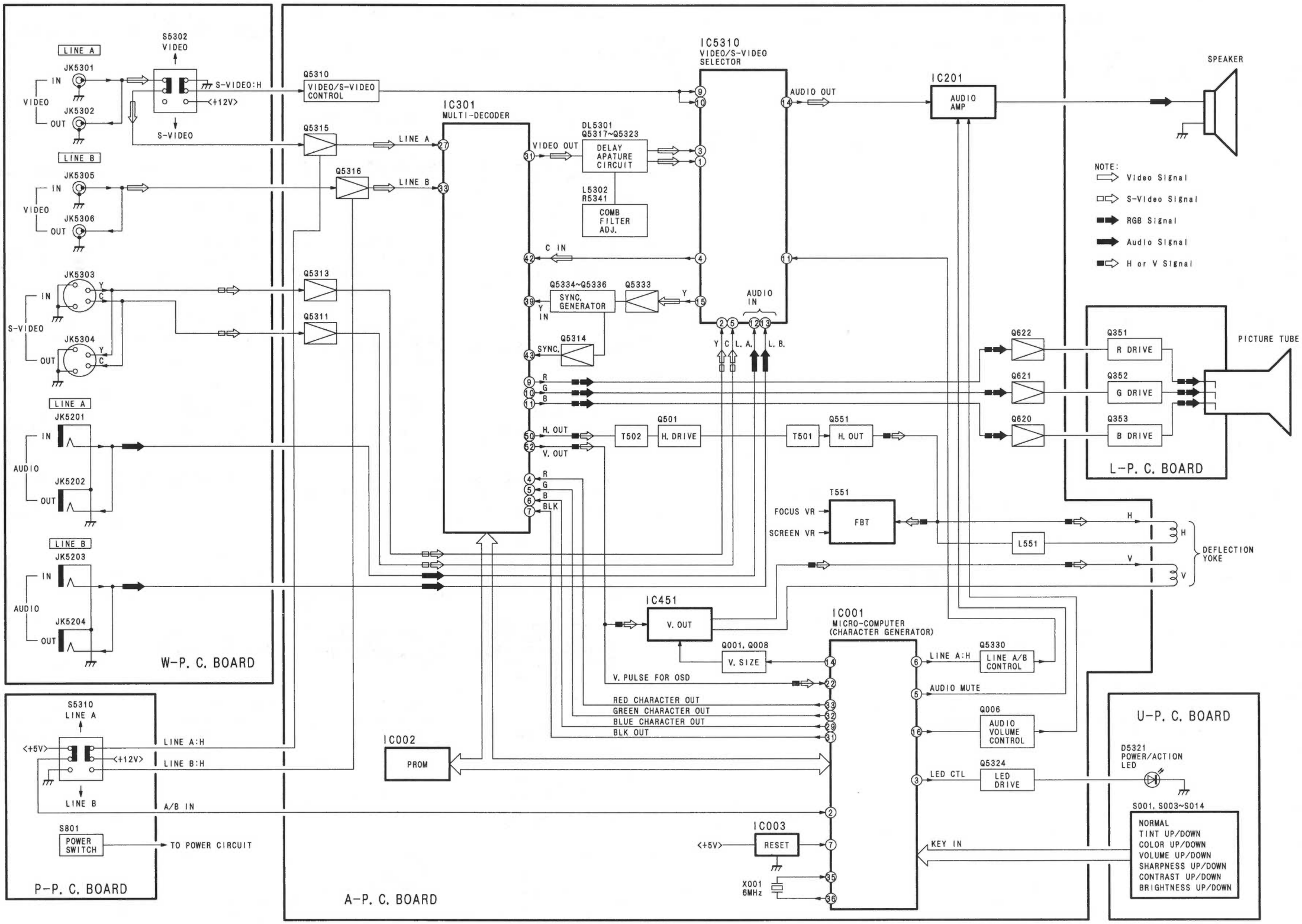


IC301 AN5163K

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	ABL/CRT neck protect	19	Not used	37	Not used
2	Pedestal clamp	20	Ground	39	Power supply +9V
3	ACL/service switch	21	Not used	39	Luminance signal input
4	R signal input	22	Not used	40	Vertical peak clamp
5	G signal input	23	Not used	41	Ground
6	B signal input	24	Not used	42	Chroma signal input
7	Ys signal input	25	Not used	43	Sync.signal input
8	Black detection	26	Not used	44	Flyback pulse
9	R signal output	27	Exit video signal input	45	Power supply +6.2V
10	G signal oupput	28	Ground	46	Saw tooth
11	B signal output	29	Not used	47	Horizontal AFC
12	Power supply +9V	30	Power supply +9V	48	Horizontal OSC
13	Chroma VCO	31	Video signal output	49	X-ray protect
14	Lock detect	32	Not used	50	Horizontal output
15	Serial data	33	Internal video signal input	51	Hold down reference
16	Serial clock	34	Not used	52	Vertical output
17	Power supply +5V	35	Not used		
18	Not used	36	Not used		

IC301 AN5163K




LINE A
JK5301
IN
VIDEO
JK5302
OUT
S5302
VIDEO
S-VIDEO:H
<+12V>
S-VIDEO
LINE B
JK5305
JK5306
JK5303
S-VIDEO
JK5304
JK5201
AUDIO
JK5202
JK5203
JK5204
W-P. C. BOARD
Q5310
VIDEO/S-VIDEO CONTROL
Q5315
Q5316
Q5313
Q5311
LINE A
LINE B
IC301
MULTI-DECODER
VIDEO OUT
DL5301
Q5317~Q5323
DELAY APATURE CIRCUIT
L5302
R5341
COMB FILTER ADJ.
C IN
Q5334~Q5336
SYNC. GENERATOR
Q5333
Y IN
Q5314
SYNC.
R
G
B
H. OUT
V. OUT
T502
Q501
H. DRIVE
BLK
IC5310
VIDEO/S-VIDEO SELECTOR
AUDIO OUT
AUDIO IN
Y
C
L. A.
L. B.
IC201
AUDIO AMP
SPEAKER
NOTE:
Video Signal
S-Video Signal
RGB Signal
Audio Signal
H or V Signal
Q622
Q621
Q620
Q551
T501
H. OUT
Q351
R DRIVE
Q352
G DRIVE
Q353
B DRIVE
PICTURE TUBE
L-P. C. BOARD
T551
FBT
FOCUS VR
SCREEN VR
L551
H
V
DEFLECTION YOKE
IC451
V. OUT
Q001, Q008
V. SIZE
V. PULSE FOR OSD
IC001
MICRO-COMPUTER (CHARACTER GENERATOR)
RED CHARACTER OUT
GREEN CHARACTER OUT
BLUE CHARACTER OUT
BLK OUT
Q5330
LINE A/B CONTROL
LINE A:H
AUDIO MUTE
Q006
AUDIO VOLUME CONTROL
Q5324
LED DRIVE
LED CTL
U-P. C. BOARD
D5321
POWER/ACTION LED
S001, S003~S014
NORMAL
TINT UP/DOWN
COLOR UP/DOWN
VOLUME UP/DOWN
SHARPNESS UP/DOWN
CONTRAST UP/DOWN
BRIGHTNESS UP/DOWN
KEY IN
IC002
PROM
IC003
RESET
<+5V>
X001
6MHz
S5310
LINE A
<+5V>
<+12V>
LINE A:H
LINE B:H
LINE B
A/B IN
S801
POWER SWITCH
TO POWER CIRCUIT
P-P. C. BOARD
A-P. C. BOARD

Schematic Diagram

IMPORTANT SAFETY NOTICE

THE SHADED AREA ON THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS.
WHEN SERVICING, IT IS ESSENTIAL THAT ONLY MANUFACTURER'S SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SHADED AREAS OF THE SCHEMATIC.

NOTE:

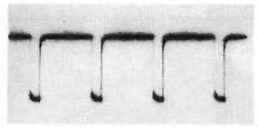
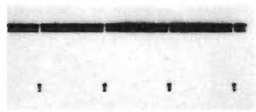
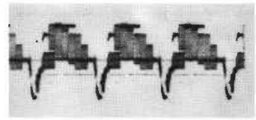
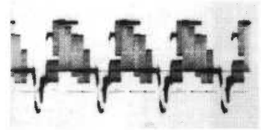
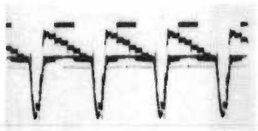
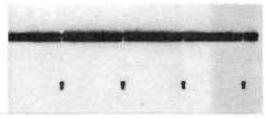
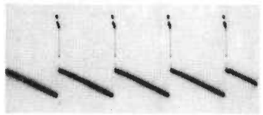
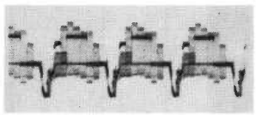
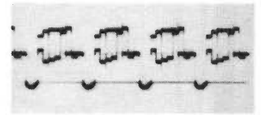
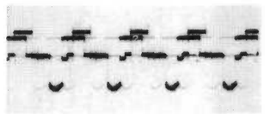
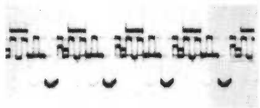
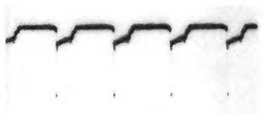
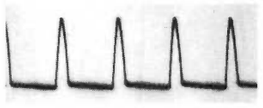
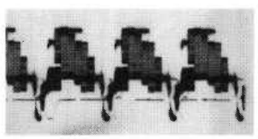
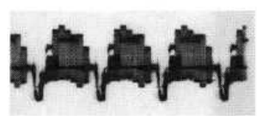
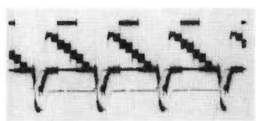
- S001 : Normal switch.
- S003 : Brightness control (−).
- S004 : Brightness control (+).
- S005 : Tint control (−).
- S006 : Tint control (+).
- S007 : Color control (−).
- S008 : Color control (+).
- S009 : Volume control (−).
- S010 : Volume control (+).
- S011 : Sharpness control (−).
- S012 : Sharpness control (+).
- S013 : Contrast control (−).
- S014 : Contrast control (+).
- S801 : Power switch in OFF position.
- S5301 : S-Video impedance switch in 75 ohm position.
- S5302 : Line A input select switch in Line A position.
- S5310 : Input select switch in Line A position.
- RESISTOR
  All resistors are carbon 1/4W resistor, unless specified otherwise.
  Unit of resistance is OHM (Ω), (K=1,000, M=1,000,000).
- CAPACITOR
  All capacitors are ceramic 50V capacitor, unless specified otherwise.
  Unit of capacitance is μF, unless otherwise noted.
- COIL
  Unit of inductance is μH.
- TEST POINT
  : Test point position.
- VOLTAGE MEASUREMENT
  Voltage is measured by an electronic voltmeter receiving rainbow color bar signal when all customer's are set to fully clockwise position.
- This schematic diagram is the latest at the time of printing and subject to change without notice.
- Positive voltage lines
  Video signal
  S-Video signal
  RGB signal
  H or V output signal
  Audio signal

Note:

The power Circuit board contains a circuit area which uses separate power supply to isolate the ground connection.
The circuit is defined by HOT and COLD indications in the schematic diagram. Take the following precautions.

PRECAUTIONS:

1. Do not touch the hot part or the hot and cold parts at the same time or you may receive a shock.
2. Do not short-circuit the hot and cold circuits or a fuse may blow and parts may break.
3. Do not connect an instrument, such as an oscilloscope, to the hot and cold circuits simultaneously of a fuse may blow.
   Connect the ground of instruments to the ground connection of the circuit being measured.
4. Make sure to disconnect the power plug before removing the chassis.

 ① IC001 30 Pin (A-P.C. Board) 5.6 Vp-p/20μsec.div.	 ② IC001 22 Pin (A-P.C. Board) 4.6 Vp-p/5 msec.div.	 ③ IC301 27 Pin (A-P.C. Board) 1.4 Vp-p/20μsec.div.	 ④ IC301 31 Pin (A-P.C. Board) 2.0 Vp-p/20μsec.div.
 ⑤ IC301 39 Pin (A-P.C. Board) 0.8 Vp-p/20μsec.div.	 ⑥ IC301 42 Pin (A-P.C. Board) 0.6 Vp-p/20μsec.div.	 ⑦ IC301 50 Pin (A-P.C. Board) 3.2 Vp-p/20μsec.div.	 ⑧ IC301 52 Pin (A-P.C. Board) 4.7 Vp-p/5 msec.div.
 ⑨ IC451 11 Pin (A-P.C. Board) 52 Vp-p/5 msec.div.	 ⑩ IC5310 4 Pin (A-P.C. Board) 1.5 Vp-p/20μsec.div.	 ⑪ IC5310 15 Pin (A-P.C. Board) 1.3 Vp-p/20μsec.div.	 ⑫ TP47R (A-P.C. Board) 5.2 Vp-p/20μsec.div.
 ⑬ TP47G (A-P.C. Board) 5.0 Vp-p/20μsec.div.	 ⑭ TP47B (A-P.C. Board) 5.0 Vp-p/20μsec.div.	 ⑮ Q551-B (A-P.C. Board) 16 Vp-p/20μsec.div.	 ⑯ Q551-C (A-P.C. Board) 1200 Vp-p/20μsec.div.
 ⑰ Q5317-E (A-P.C. Board) 2.0 Vp-p/20μsec.div.	 ⑱ Q5321-E (A-P.C. Board) 1.7 Vp-p/20μsec.div.	 ⑲ Q5323-E (A-P.C. Board) 2.0 Vp-p/20μsec.div.	 ⑳ Q351-C (L-P.C. Board) 120 Vp-p/20μsec.div.
 ㉑ Q352-C (L-P.C. Board) 120 Vp-p/20μsec.div.	 ㉒ Q353-C (L-P.C. Board) 120 Vp-p/20μsec.div.		

REPLACEMENT PARTS LIST

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

Ref. No.	Part No.	Description
		CAPACITORS
C001	ECKF1H101KB	CAP,C 100PF–K–50V
C002	ECKF1H101KB	CAP,C 100PF–K–50V
C003	ECEA1CU221	CAP,E 220UF/16V
C004	ECKF1H101KB	CAP,C 100PF–K–50V
C012	ECEA1HU3R3	CAP,E 3.3UF/50V
C025	ECEA1HU3R3	CAP,E 3.3UF/50V
C034	ECEA1CU471	CAP,E 470UF/16V
C035	ECEA1EU471	CAP,E 470UF/25V
C042	ECEA1HU010	CAP,E 1UF/50V
C043	ECEA1CU100	CAP,E 10UF/16V
C045	ECQB1H123KF	CAP,P .012UF–K–50V
C046	ECQB1H123KF	CAP,P .012UF–K–50V
C047	ECQB1H123KF	CAP,P .012UF–K–50V
C048	ECKF1H103ZF	CAP,C .01UF–Z–50V
C049	ECKF1H103ZF	CAP,C .01UF–Z–50V
C058	ECKF1H271KB	CAP,C 270PF–K–50V
C063	ECKF1H103ZF	CAP,C .01UF–Z–50V
C081	ECKF1H103ZF	CAP,C .01UF–Z–50V
C101	ECEA1CU102	CAP,E 1000UF/16V
C102	ECEA1EU100	CAP,E 10UF/25V
C112	ECKF1H103ZF	CAP,C .01UF–Z–50V
C113	ECEA1CU100	CAP,E 10UF/16V
C115	ECEA1CU330	CAP,E 33UF/16V
C118	ECKF1H103ZF	CAP,C .01UF–Z–50V
C205	ECEA1CU102	CAP,E 1000UF/16V
C210	ECEA1HUR47	CAP,E .47UF/50V
C212	ECEA1CU100	CAP,E 10UF/16V
C213	ECEA1CU100	CAP,E 10UF/16V
C214	ECEA1CU100	CAP,E 10UF/16V
C216	ECQB1H683KF	CAP,P .068UF–K–50V
C217	ECEA1EU101	CAP,E 100UF/25V
C218	ECEA1EU102	CAP,E 1000UF/25V
C219	ECQB1H152KF	CAP,P .0015UF–K–50V
C301	ECEA1CN100S	CAP,E 10UF/16V
C302	ECEA1AU331	CAP,E 330UF/10V
C304	ECEA1EU4R7	CAP,E 4.7UF/25V
C305	ECEA1HUR33	CAP,E .33UF/50V
C311	ECEA1CU470	CAP,E 47UF/16V
C312	ECKF1H103ZF	CAP,C .01UF–Z–50V
C313	ECEA1CU220	CAP,E 22UF/16V
C321	ECEA1HU4R7	CAP,E 4.7UF/50V
C351	ECKF1H271KB	CAP,C 270PF–K–50V
C352	ECKF1H271KB	CAP,C 270PF–K–50V
C353	ECKF1H331KB	CAP,C 330PF–K–50V
C355	ECKD3D681KB	CAP,C 680PF–K–2KV
C356	ECEA1CU100	CAP,E 10UF/16V
C357	ECEA1CU101	CAP,E 100UF/16V
C358	ECKD2H103KB	CAP,C .01UF–K–500V
C359	ECEA2EU3R3	CAP,E 3.3UF/250V
C401	ECEA1HUR33	CAP,E .33UF/50V
C402	ECKF1H681KB	CAP,C 680PF–K–50V
C403	ECEA1HN010S	CAP,E 1UF/50V
C451	ECEA1CGE331	CAP,E 330UF/16V
C452	ECQV1H105JZ	CAP,P 1.0UF–J–50V
C453	ECEA1HFS2R2	CAP,E 2.2UF/50V
C454	ECEA1EU222	CAP,E 2200UF/25V
C455	ECEA1VGE101	CAP,E 100UF/35V
C456	ECQB1H473KF	CAP,P .047UF–K–50V
C457	ECQB1H103KF	CAP,P .01UF–K–50V
C463	ECEA1HU010	CAP,E 1UF/50V
C501	ECEA1CU101	CAP,E 100UF/16V
C502	ECEA1HU3R3	CAP,E 3.3UF/50V
C503	ECQB1H123KF	CAP,P .012UF–K–50V
C504	ECQB1H103KF	CAP,P .01UF–K–50V
C505	ECQB1H223KF	CAP,P .022UF–K–50V
C506	ECEA1EU221	CAP,E 220UF/25V
C508	ECQB1H223KF	CAP,P .022UF–K–50V
C509	ECCF1H221JU	CAP,C 220PF–J–50V
C510	ECCD2H100D	CAP,C 10PF–D–500V
C511	ECKD2H182KB	CAP,C .0018UF–K–500V
C512	ECEA1EU221	CAP,E 220UF/25V
C515	ECEA1EU100	CAP,E 10UF/25V
C521	ECEA1CU100	CAP,E 10UF/16V
C522	ECQB1H103KF	CAP,P .01UF–K–50V
C531	**ECEA1EU330**	**CAP,E 33UF/25V**
C532	ECEA1EU4R7	CAP,E 4.7UF/25V
C541	ECCF1H121JC	CAP,C 120PF–J–50V
C548	**ECKD3D121JB**	**RES,C 120PF–J–2KV**
C549	**ECKD3D331JB**	**CAP,C 330PF–J–2KV**
C550	**ECWH12H562JS**	**CAP,P .0056UF–J–1.2KV**
C552	**ECWH12H472JS**	**CAP,P .0047UF–J–1.2KV**
C553	ECKD2H561KB	CAP,C 560PF–K–500V
C554	**ECQM4333JZ**	**CAP,P .033UF–J–400V**
C555	**ECEA2EU220**	**CAP,E 22UF/250V**
C557	**ECEA1EU471**	**CAP,E 470UF/25V**
C558	ECEA0JU101	CAP,E 100UF/6.3V
C559	ECEA1CU100	CAP,E 10UF/16V
C561	ECEA1HU2R2	CAP,E 2.2UF/50V
C562	ECKD2H561KB	CAP,C 560PF–K–500V
C563	**ECKD3D681JB**	**CAP,C 680PF–J–2KV**
C565	ECQE2474KF	CAP,P .47UF–K–250V
C567	**ECEA1VU102**	**CAP,E 1000UF/35V**
C569	**ECQF2H304JS**	**CAP,P .3UF–J–200V**
C571	ECKF1H103KB	CAP,C .01UF–K–50V
C572	ECKF1H103KB	CAP,C .01UF–K–50V
C581	**ECKDNS222ME**	**CAP,C .0022UF–M–125VAC**
C582	**ECKDNS222ME**	**CAP,C .0022UF–M–125VAC**
C602	ECCF1H150JU	CAP,C 15PF–J–50V
C620	ECEA1CN100S	CAP,E 10UF/16V
C621	ECEA1CN100S	CAP,E 10UF/16V
C801	**ECKD2H103PU**	**CAP,C .01UF–P–500V**
C803	**ECKD2H103PU**	**CAP,C .01UF–P–500V**
C804	**ECKD2H103PU**	**CAP,C .01UF–P–500V**
C805	**EC0S2DA471BB**	**CAP,E 470/200V**
C806	**ECEA2CGE220**	**CAP,E 22UF/160V**
C808	**ECQU2A823MN**	**CAP,P .082UF–M–250VAC**
C809	**ECQU2A224MN**	**CAP,P .22UF–M–250VAC**
C811	**ECEA1HN3R3S**	**CAP,E 3.3UF/50V**
C813	**ECEA160V33Z**	**CAP,E 33UF/160V**
C816	**ECEA0JU221**	**CAP,E 220UF/6.3V**
C2301	ECQV1H104JZ	CAP,P .1UF–J–50V
C5211	ECEA1CU330	CAP,E 33UF/16V
C5212	ECEA1CU330	CAP,E 33UF/16V
C5312	ECEA1CU100	CAP,E 10UF/16V
C5313	ECKF1H103ZF	CAP,C .01UF–Z–50V
C5314	ECQB1H103KF	CAP,P .01UF–K–50V
C5315	ECEA1CU330	CAP,E 33UF/16V
C5316	ECEA1HU010	CAP,E 1UF/50V
C5317	ECEA1HU010	CAP,E 1UF/50V
C5319	ECEA1CU330	CAP,E 33UF/16V
C5321	ECEA1CN100S	CAP,E 10UF/16V
C5322	ECQB1H473KF	CAP,P .047UF–K–50V
C5323	ECQB1H473KF	CAP,P .047UF–K–50V
C5325	ECCF1H470JC	CAP,C 47PF–J–50V
C5330	ECEA1CU330	CAP,E 33UF/16V
C5331	ECEA1HUR22	CAP,E .22UF/50V
C5341	ECEA1HU010	CAP,E 1UF/50V
C5342	ECEA1HU010	CAP,E 1UF/50V
C5343	ECEA1HU010	CAP,E 1UF/50V
C5344	ECEA1HU010	CAP,E 1UF/50V
C5345	ECKF1H103ZF	CAP,C .01UF–Z–50V
C5346	ECQB1H103KF	CAP,P .01UF–K–50V
		DIODES
D003	**MA167**	**DIODE**
D025	MA165	DIODE
D026	MA165	DIODE
D031	ERA15–01	DIODE
D032	MA4110M	DIODE, ZENER
D033	MA165	DIODE
D043	MA4110M	DIODE, ZENER
D048	MA4068M	DIODE, ZENER
D049	MA4068M	DIODE, ZENER
D211	EU02V0	DIODE

REPLACEMENT PARTS LIST

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Ref. No.	Part No.	Description
D212	TVSRD2.0FB	DIODE, ZENER
D213	MA165	DIODE
D214	MA165	DIODE
D220	EU02W	DIODE
D305	MA29W	DIODE
D306	MA165	DIODE
D307	MA165	DIODE
D451	ERA15-01	DIODE
D452	MA1082M	DIODE, ZENER
D453	MA4150M	DIODE
D454	MA165	DIODE
D455	MA4120M	DIODE
D456	MA4180H	DIODE, ZENER
D457	MA165	DIODE
D458	ERA15-01	DIODE
D501	MA1082L	DIODE
D502	MA700	DIODE
D506	MA165	DIODE
D531	**AS01**	**DIODE**
D532	**MA1062L**	**DIODE, ZENER**
D533	MA4082M	DIODE
D534	MA165	DIODE
D541	MA165	DIODE
D550	TVSRU2	DIODE
D551	**ERD07-15**	**DIODE**
D552	**TVSRU2**	**DIODE**
D554	**AS01**	**DIODE**
D555	MA165	DIODE
D556	**MA4360H**	**DIODE, ZENER**
D558	MA29W	DIODE
D559	AS01	DIODE
D560	**AS01**	**DIODE**
D561	**AS01**	**DIODE**
D562	MA165	DIODE
D563	MA165	DIODE
D570	**MA4062L**	**DIODE, ZENER**
D571	**MA4051L**	**DIODE, ZENER**
D572	**MA4051L**	**DIODE, ZENER**
D801	**EM02BM**	**DIODE**
D802	**EM02BM**	**DIODE**
D803	**EM02BM**	**DIODE**
D804	**EM02BM**	**DIODE**
D806	**MA2056A**	**DIODE**
D807	**ERC13-08**	**DIODE**
D808	MA4051L	DIODE, ZENER
D809	MA165	DIODE
D851	**TRPF5B0M050F**	**THERMISTOR**
D5310	MA165	DIODE
D5311	MA165	DIODE
D5312	MA165	DIODE
D5313	MA165	DIODE
D5321	LN31GCP-UH	DIODE, LED
D5324	MA165	DIODE
D5331	MA4039M	DIODE, ZENER
D5332	MA165	DIODE
		FUSES
F001	**0BA1F40NU100**	**FUSE 4.0A/125V**
		INTEGRATED CIRCUITS
IC001	MN152811HYG	INT CKT
IC002	24C01AIPB21	INT CKT
IC003	UPC2255HLB	INT CKT
IC102	AN78M09	PLUS 9V AVR
IC201	AN5265	INT CKT
IC301	AN5163K	INT CKT
IC451	LA7835-TV	INT CKT
IC551	AN78M10	PLUS 10V AVR
IC552	AN78M05	PLUS 5V AVR
IC801	**TVSSTR30130**	**INT CKT**
IC802	**TLP621GR**	**PHOTO COUPLER**
IC5310	TVSTC4053	INT CKT

Ref. No.	Part No.	Description
		COILS
DL5301	EFDEN645B35B	DELAY LINE
DEG	**0LK19048A**	**COIL, DEGAUSSING 13"**
DY	**0LY15304F**	**YOKE, DEFLECTION**
L001	EXCELSA24	FERRITE BEAD
L301	ELESN220KA	COIL, PEAKING 22UH
L302	ELESN470KA	COIL, 47UH
L551	**TLH15629T1**	**COIL**
L552	EXCELSA39	FERRITE BEAD
L554	EXCELSA39	FERRITE BEAD
L555	EXCELSR35S	FERRITE BEAD
L556	EXCELSR35S	FERRITE BEAD
L558	EXCELSA24	FERRITE BEAD
L559	ELC08D055	FILTER
L561	EXCELSA24	FERRITE BEAD
L562	EXCELSA39	FERRITE BEAD
L563	EXCELSR35S	FERRITE BEAD
L801	**ELF18D650K**	**CHOKE, AC LINE**
L5302	EIK7ES010B	VC MIXER COIL
L5303	ELESN390KA	COIL, PEAKING 39UH
L5305	ELESN100KA	COIL, PEAKING 10UH
		TRANSISTORS
Q001	2SC3311AQR	TRANSISTOR
Q006	2SC3311AQR	TRANSISTOR
Q008	2SA1309QR	TRANSISTOR
Q012	2SC3311AQR	TRANSISTOR
Q013	2SA1309QR	TRANSISTOR
Q014	2SC3311AQR	TRANSISTOR
Q016	2SC3311AQR	TRANSISTOR
Q211	2SC3311AQR	TRANSISTOR
Q302	2SC3311AQR	TRANSISTOR
Q351	2SC3063	TRANSISTOR
Q352	2SC3063	TRANSISTOR
Q353	2SC3063	TRANSISTOR
Q354	2SA1309QR	TRANSISTOR
Q452	2SC3311AQR	TRANSISTOR
Q453	2SC3311AQR	TRANSISTOR
Q501	2SC1573AH	TRANSISTOR
Q541	2SC3311AQR	TRANSISTOR
Q551	BU2506DF	TRANSISTOR
Q620	2SC3311AQR	TRANSISTOR
Q621	2SC3311AQR	TRANSISTOR
Q622	2SC3311AQR	TRANSISTOR
Q801	**2SA1767Q**	**TRANSISTOR**
Q5310	2SC3311AQR	TRANSISTOR
Q5311	2SC3311AQR	TRANSISTOR
Q5313	2SC3311AQR	TRANSISTOR
Q5314	2SA1309QR	TRANSISTOR
Q5315	2SC3311AQR	TRANSISTOR
Q5316	2SC3311AQR	TRANSISTOR
Q5317	2SC3311AQR	TRANSISTOR
Q5318	2SC3311AQR	TRANSISTOR
Q5319	2SC3311AQR	TRANSISTOR
Q5320	2SC3311AQR	TRANSISTOR
Q5321	2SC3311AQR	TRANSISTOR
Q5322	2SC3311AQR	TRANSISTOR
Q5323	2SC3311AQR	TRANSISTOR
Q5324	2SC3311AQR	TRANSISTOR
Q5330	2SC3311AQR	TRANSISTOR
Q5333	2SC3311AQR	TRANSISTOR
Q5334	2SC3311AQR	TRANSISTOR
Q5335	2SC3311AQR	TRANSISTOR
Q5336	2SA1309QR	TRANSISTOR
		RELAYS
RL001	**TSE1864**	**RELAY**

REPLACEMENT PARTS LIST

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

Ref. No.	Part No.	Description
		RESISTORS
R001	ERDS2TJ472	RES,C 4.7K–J–1/4
R002	ERDS2TJ103	RES,C 10K–J–1/4
R005	ERDS2TJ332	RES,C 3.3K–J–1/4
R006	ERD25TJ332	RES,C 3.3K–J–1/4
R007	ERD25TJ101	RES,C 100–J–1/4
R008	ERDS2TJ103	RES,C 10K–J–1/4
R009	ERDS2TJ332	RES,C 3.3K–J–1/4
R010	ERDS2TJ562	RES,C 5.6K–J–1/4
R011	ERDS2TJ473	RES,C 47K–J–1/4
R012	ERDS2TJ222	RES,C 2.2K–J–1/4
R013	ERDS2TJ103	RES,C 10K–J–1/4
R014	ERDS2TJ103	RES,C 10K–J–1/4
R015	ERDS2TJ333	RES,C 33K–J–1/4
R016	ERDS2TJ153	RES,C 15K–J–1/4
R019	ERDS2TJ103	RES,C 10K–J–1/4
R020	ERD25TJ560	RES,C 56–J–1/4
R022	ERD25TJ103	RES,C 10K–J–1/4
R025	ERDS2TJ822	RES,C 8.2K–J–1/4
R027	ERDS2TJ331	RES,C 330–J–1/4
R030	ERDS2TJ151	RES,C 150–J–1/4
R031	ERDS2TJ153	RES,C 15K–J–1/4
R035	ERDS2TJ331	RES,C 330–J–1/4
R036	ERDS2TJ822	RES,C 8.2K–J–1/4
R037	ERDS2TJ562	RES,C 5.6K–J–1/4
R038	ERD25TJ101	RES,C 100–J–1/4
R040	ERD25TJ182	RES,C 1.8K–J–1/4
R041	ERD25TJ182	RES,C 1.8K–J–1/4
R042	ERD25TJ182	RES,C 1.8K–J–1/4
R043	ERD25TJ182	RES,C 1.8K–J–1/4
R044	ERDS2TJ681	RES,C 680–J–1/4
R045	ERDS2TJ681	RES,C 680–J–1/4
R046	ERD25TJ392	RES,C 3.9K–J–1/4
R047	ERDS2TJ681	RES,C 680–J–1/4
R048	ERDS2TJ222	RES,C 2.2K–J–1/4
R054	ERDS2TJ473	RES,C 47K–J–1/4
R055	ERDS2TJ471	RES,C 470–J–1/4
R061	ERDS2TJ102	RES,C 1K–J–1/4
R062	ER0S2CKF2051	RES,M 2.05K–F–1/4
R063	ER0S2CKF1961	RES,M 1.96K–F–1/4
R064	ER0S2CKF4531	RES,M 4.53K–F–1/4
R065	ERDS2TJ102	RES,C 1K–J–1/4
R066	ER0S2CKF1002	RES,M 10K–F–1/4
R067	ER0S2CKF1692	RES,M 16.9K–F–1/4
R068	ER0S2CKF7871	RES,M 7.87K–F–1/4
R069	ERDS2TJ102	RES,C 1K–J–1/4
R070	ER0S2CKF3011	RES,M 3.01K–F–1/4
R071	ER0S2CKF2051	RES,M 2.05K–F–1/4
R072	ERDS2TJ102	RES,C 1K–J–1/4
R073	ER0S2CKF1002	RES,M 10K–F–1/4
R074	ER0S2CKF7871	RES,M 7.87K–F–1/4
R075	ER0S2CKF4531	RES,M 4.53K–F–1/4
R076	ER0S2CKF3011	RES,M 3.01K–F–1/4
R078	ER0S2CKF1961	RES,M 1.96K–F–1/4
R080	ERDS2TJ122	RES,C 1.2K–J–1/4
R085	**ERDS2TJ272**	**RES,C 2.7K–J–1/4**
R086	ERDS2TJ333	RES,C 33K–J–1/4
R087	ERDS2TJ472	RES,C 4.7K–J–1/4
R088	**ERDS2TJ102**	**RES,C 1K–J–1/4**
R089	**ERDS2TJ333**	**RES,C 33K–J–1/4**
R211	ERDS2TJ103	RES,C 10K–J–1/4
R212	ERDS2TJ274	RES,C 270K–J–1/4
R214	ERDS2TJ102	RES,C 1K–J–1/4
R215	ERD25TJ102	RES,C 1K–J–1/4
R216	ERDS2TJ122	RES,C 1.2K–J–1/4
R217	ERDS2TJ104	RES,C 100K–J–1/4
R218	ERDS2TJ274	RES,C 270K–J–1/4
R219	ERDS2TJ103	RES,C 10K–J–1/4
R220	ERDS2TJ4R7	RES,C 4.7–J–1/4
R221	**ERQ1CJP6R8**	**RES,F 6.8–J–1W**
R305	ERDS2TJ102	RES,C 1K–J–1/4
R306	ERDS2TJ102	RES,C 1K–J–1/4
R307	ERDS2TJ101	RES,C 100–J–1/4
R308	ERDS2TJ103	RES,C 10K–J–1/4
R309	ERDS2TJ101	RES,C 100–J–1/4
R310	ERDS2TJ101	RES,C 100–J–1/4
R311	ERDS2TJ122	RES,C 1.2K–J–1/4
R312	ERDS2TJ122	RES,C 1.2K–J–1/4
R314	ERDS2TJ105	RES,C 1MEG–J–1/4
R330	ERDS2TJ560	RES,C 56–J–1/4
R331	ERD25TJ560	RES,C 56–J–1/4
R336	ERDS2TJ223	RES,C 22K–J–1/4
R337	ERDS2TJ334	RES,C 330K–J–1/4
R346	ERDS2TJ101	RES,C 100–J–1/4
R351	**ERG2ANJ123**	**RES,M 12K–J–2W**
R352	**ERG2ANJ123**	**RES,M 12K–J–2W**
R353	**ERG2ANJ123**	**RES,M 12K–J–2W**
R354	ERDS1TJ272	RES,C 2.7K–J–1/2
R355	ERDS1TJ272	RES,C 2.7K–J–1/2
R356	ERDS1TJ272	RES,C 2.7K–J–1/2
R357	ERDS2TJ101	RES,C 100–J–1/4
R358	ERDS2TJ101	RES,C 100–J–1/4
R359	ERDS2TJ101	RES,C 100–J–1/4
R360	ERDS2TJ331	RES,C 330–J–1/4
R361	ERDS2TJ331	RES,C 330–J–1/4
R362	ERDS2TJ331	RES,C 330–J–1/4
R363	ERDS2TJ561	RES,C 560–J–1/4
R365	ERDS2TJ221	RES,C 220–J–1/4
R366	ERDS2TJ470	RES,C 47–J–1/4
R367	ERDS2TJ470	RES,C 47–J–1/4
R368	ERDS2TJ470	RES,C 47–J–1/4
R369	ERDS2TJ101	RES,C 100–J–1/4
R401	ERDS2TJ224	RES,C 220K–J–1/4
R402	ERD25TJ561	RES,C 560–J–1/4
R404	ERDS2TJ221	RES,C 220–J–1/4
R451	ERDS2TJ221	RES,C 220–J–1/4
R452	ERDS2TJ333	RES,C 33K–J–1/4
R453	ERDS2TJ123	RES,C 12K–J–1/4
R454	ERDS1FJ2R2	RES,C 2.2–J–1/2
R455	ERDS2TJ183	RES,C 18K–J–1/4
R456	ERDS2TJ682	RES,C 6.8K–J–1/4
R457	ERDS2TJ152	RES,C 1.5K–J–1/4
R458	ERDS2TJ123	RES,C 12K–J–1/4
R459	ERDS2TJ221	RES,C 220–J–1/4
R460	ERDS1FJ3R3	RES,C 3.3–J–1/2
R462	ERDS2TJ102	RES,C 1K–J–1/4
R463	ERDS2TJ332	RES,C 3.3K–J–1/4
R464	ERDS2TJ103	RES,C 10K–J–1/4
R467	ERDS2TJ102	RES,C 1K–J–1/4
R471	ERD25TJ103	RES,C 10K–J–1/4
R474	ERD25TJ102	RES,C 1K–J–1/4
R479	ERDS2TJ333	RES,C 33K–J–1/4
R501	ERDS2TJ391	RES,C 390–J–1/4
R502	ERDS2TJ332	RES,C 3.3K–J–1/4
R503	ERDS2TJ332	RES,C 3.3K–J–1/4
R504	ERD25TJ821	RES,C 820–J–1/4
R505	ERDS2TJ472	RES,C 4.7K–J–1/4
R506	ERDS2TJ560	RES,C 56–J–1/4
R507	ERDS2TJ272	RES,C 2.7K–J–1/4
R508	ERDS2TJ392	RES,C 3.9K–J–1/4
R509	ERG2SJS182	RES,M 1.8K–J–2W
R510	ERG3ANJ332	RES,M 3.3K–J–3W
R511	ERG3ANJ332	RES,M 3.3K–J–3W
R512	ERD25TJ562	RES,C 5.6K–J–1/4
R513	ERDS2TJ122	RES,C 1.2K–J–1/4
R517	ERDS2TJ224	RES,C 220K–J–1/4
R531	**ERQ14AJ470**	**RES,F 47–J–1/4**
R532	**ER0S2CKF6190**	**RES,M 619–F–1/4**
R533	**ER0S2CKF5600**	**RES,M 560–F–1/4**
R534	**ERDS1TJ473**	**RES,C 47K–J–1/2**
R535	**ER0S2CKF4701**	**RES,M 4.7K–F–1/4**
R538	ERDS2TJ561	RES,C 560–J–1/4
R539	**ER025CKF100**	**RES,M 10–F–1/4**
R541	ERDS2TJ333	RES,C 33K–J–1/4
R544	ERDS2TJ103	RES,C 10K–J–1/4
R547	ERDS2TJ153	RES,C 15K–J–1/4
R550	ERG1ANJ102	RES,M 1K–J–1W

REPLACEMENT PARTS LIST

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

Ref. No.	Part No.	Description
R551	ERDS1FJ1R0	RES,C 1.0–J–1/2
R553	ERD25TJ100	RES,C 10–J–1/4
R554	ERDS2TJ823	RES,C 82K–J–1/4
R555	ERDS2TJ154	RES,C 150K–J–1/4
R556	**ERDS2TJ472**	**RES,C 4.7K–J–1/4**
R557	**ERDS2TJ103**	**RES,C 10K–J–1/4**
R558	**ERQ12HKR22**	**RES,F .22–K–1/2**
R560	ERQ14AJ101	RES,F 100–J–1/4
R561	**ERQ12HKR22**	**RES,F .22–K–1/2**
R604	ERDS2TJ471	RES,C 470–J–1/4
R605	ERDS2TJ331	RES,C 330–J–1/4
R606	ERDS2TJ331	RES,C 330–J–1/4
R615	ERDS2TJ103	RES,C 10K–J–1/4
R616	ERDS2TJ103	RES,C 10K–J–1/4
R617	ERDS2TJ103	RES,C 10K–J–1/4
R620	ERDS2TJ272	RES,C 2.7K–J–1/4
R621	ERDS2TJ122	RES,C 1.2K–J–1/4
R622	ERDS2TJ472	RES,C 4.7K–J–1/4
R623	ERDS2TJ122	RES,C 1.2K–J–1/4
R624	ERDS2TJ122	RES,C 1.2K–J–1/4
R802	**ERF20ZJ271**	**RES,W 270–J–20W**
R803	**ERF3AK1R0**	**RES,W 1.0–10–3W**
R804	ERD25TJ224	RES,C 220K–J–1/4
R805	**ERDS1FJ103**	**RES,C 10K–J–1/2**
R806	**ERF5ZK5R6**	**RES,W 5.6–K–5W**
R807	**ERQ14AJ470V**	**RES,F 47–J–1/4**
R808	**ERQ14AJ470V**	**RES,F 47–J–1/4**
R813	**ERDS1FJ2R2**	**RES,C 2.2–J–1/2**
R814	**ERDS1FJ2R2**	**RES,C 2.2–J–1/2**
R815	**ERDS1FJ2R7**	**RES,C 2.7–J–1/2**
R816	**ERDS2TJ152**	**RES,C 1.5K–J–1/4**
R817	**ERDS1TJ393**	**RES,C 39K–J–1/2**
R818	ERC12ZGK335	RES,S 3.3MEG–K–1/2
R819	ERDS2TJ221	RES,C 220–J–1/4
R820	ERDS2TJ103	RES,C 10K–J–1/4
R5201	ERD25TJ102	RES,C 1K–J–1/4
R5202	ERD25TJ104	RES,C 100K–J–1/4
R5203	ERD25TJ102	RES,C 1K–J–1/4
R5204	ERD25TJ104	RES,C 100K–J–1/4
R5205	ERD25TJ750	RES,C 75–J–1/4
R5211	ERDS2TJ562	RES,C 5.6K–J–1/4
R5212	ERDS2TJ562	RES,C 5.6K–J–1/4
R5213	ERDS2TJ104	RES,C 100K–J–1/4
R5214	ERDS2TJ104	RES,C 100K–J–1/4
R5306	ERD25TJ750	RES,C 75–J–1/4
R5307	ERD25TJ750	RES,C 75–J–1/4
R5308	ERD25TJ750	RES,C 75–J–1/4
R5310	ERDS2TJ333	RES,C 33K–J–1/4
R5311	ERDS2TJ333	RES,C 33K–J–1/4
R5312	ERDS2TJ333	RES,C 33K–J–1/4
R5313	ERDS2TJ562	RES,C 5.6K–J–1/4
R5314	ERDS2TJ333	RES,C 33K–J–1/4
R5315	ERDS2TJ101	RES,C 100–J–1/4
R5316	ERDS2TJ103	RES,C 10K–J–1/4
R5317	ERDS2TJ470	RES,C 47–J–1/4
R5319	ERDS2TJ123	RES,C 12K–J–1/4
R5321	ERDS2TJ393	RES,C 39K–J–1/4
R5323	ERDS2TJ223	RES,C 22K–J–1/4
R5324	ERDS2TJ331	RES,C 330–J–1/4
R5325	ERDS2TJ822	RES,C 8.2K–J–1/4
R5326	ERDS2TJ152	RES,C 1.5K–J–1/4
R5327	ERDS2TJ181	RES,C 180–J–1/4
R5328	ERDS2TJ101	RES,C 100–J–1/4
R5329	ERDS2TJ102	RES,C 1K–J–1/4
R5330	ERDS2TJ183	RES,C 18K–J–1/4
R5331	ERDS2TJ333	RES,C 33K–J–1/4
R5332	ERDS2TJ123	RES,C 12K–J–1/4
R5333	ERDS2TJ331	RES,C 330–J–1/4
R5334	ERDS2TJ103	RES,C 10K–J–1/4
R5335	ERDS2TJ152	RES,C 1.5K–J–1/4
R5336	ERDS2TJ333	RES,C 33K–J–1/4
R5337	ERDS2TJ181	RES,C 180–J–1/4
R5338	ERDS2TJ333	RES,C 33K–J–1/4
R5339	ERDS2TJ102	RES,C 1K–J–1/4
R5340	ERDS2TJ102	RES,C 1K–J–1/4
R5341	EVND8AA03B22	CONTROL 200 OHM
R5342	ERDS2TJ331	RES,C 330–J–1/4
R5343	ERDS2TJ331	RES,C 330–J–1/4
R5344	ERDS2TJ103	RES,C 10K–J–1/4
R5345	ERDS2TJ152	RES,C 1.5K–J–1/4
R5346	ERDS2TJ331	RES,C 330–J–1/4
R5347	ERDS2TJ152	RES,C 1.5K–J–1/4
R5348	ERDS2TJ821	RES,C 820–J–1/4
R5349	ERDS2TJ102	RES,C 1K–J–1/4
R5350	ERDS2TJ122	RES,C 1.2K–J–1/4
R5351	ERDS2TJ682	RES,C 6.8K–J–1/4
R5357	ERDS2TJ103	RES,C 10K–J–1/4
R5358	ERDS2TJ101	RES,C 100–J–1/4
R5360	ERDS2TJ152	RES,C 1.5K–J–1/4
R5361	ERDS2TJ391	RES,C 390–J–1/4
R5363	ERDS2TJ222	RES,C 2.2K–J–1/4
R5364	ERDS2TJ681	RES,C 680–J–1/4
R5365	ERDS2TJ821	RES,C 820–J–1/4
R5366	ERDS2TJ103	RES,C 10K–J–1/4
R5367	ERDS2TJ103	RES,C 10K–J–1/4
R5368	ERDS2TJ561	RES,C 560–J–1/4
R5369	ERDS2TJ820	RES,C 82–J–1/4
R5372	ERDS2TJ821	RES,C 820–J–1/4
R5373	ERDS2TJ332	RES,C 3.3K–J–1/4
R5374	ERDS2TJ470	RES,C 47–J–1/4
R5375	ERDS2TJ334	RES,C 330K–J–1/4
R5376	ERDS2TJ332	RES,C 3.3K–J–1/4
R5377	ERDS2TJ681	RES,C 680–J–1/4
R5378	ERDS2TJ821	RES,C 820–J–1/4
R5379	ERDS2TJ221	RES,C 220–J–1/4
R5380	ERDS2TJ103	RES,C 10K–J–1/4
R5383	ERDS2TJ103	RES,C 10K–J–1/4
R5385	ERDS2TJ563	RES,C 56K–J–1/4
R5386	ERDS2TJ563	RES,C 56K–J–1/4
R5389	ERDS2TJ222	RES,C 2.2K–J–1/4
R5390	ERDS2TJ222	RES,C 2.2K–J–1/4
R5391	ERDS2TJ103	RES,C 10K–J–1/4
		SWITCHES
S001	EVQQS507K	SWITCH, PUSH
S003	EVQQS507K	SWITCH, PUSH
S004	EVQQS507K	SWITCH, PUSH
S005	EVQQS507K	SWITCH, PUSH
S006	EVQQS507K	SWITCH, PUSH
S007	EVQQS507K	SWITCH, PUSH
S008	EVQQS507K	SWITCH, PUSH
S009	EVQQS507K	SWITCH, PUSH
S010	EVQQS507K	SWITCH, PUSH
S011	EVQQS507K	SWITCH, PUSH
S012	EVQQS507K	SWITCH, PUSH
S013	EVQQS507K	SWITCH, PUSH
S014	EVQQS507K	SWITCH, PUSH
S801	ESB41A1152Z	SWITCH
S5301	TSE80391	SWITCH
S5302	TSE80391	SWITCH
S5310	ESB41A1152Z	SWITCH
		TRANSFORMERS
T001	**TLP16297**	**TRANSFORMER, POWER SUPPLY**
T501	TLH15412	TRANSFORMER, HORIZONTAL DRIVER
T502	**ETE19Z30AY**	**TRANSFORMER, HORIZONTAL COUPLING**
T551	**TLF15615F2**	**TRANSFORMER, FLYBACK**
		CRYSTALS/FILTERS
X001	EF0EC6004T4	CRYSTAL
X501	EF0A503KS41	CRYSTAL, OSCILLATOR
X601	TS816M32	CRYSTAL 3.58MHZ OSCILLATOR

REPLACEMENT PARTS LIST

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

Ref. No.	Part No.	Description
		OTHERS
M001	EASG8P79A2	SPEAKER, 3 "
M002	SKL227–2	FEET RUBBER 4 PCS
M003	TBM2A30833	BADGE, PANASONIC
M004	TBX1484900G	ASSY. 13 PUSHBUTTON
M005	TBX8780500	1 PUSHBUTTON: POWER
M006	TBX8780600	1 AUDIO/VIDEO IN–OUT BUTTON
M007	TES2A20305	SPRING, DAG GROUND
M008	**TJS1A5081**	**CRT SOCKET**
M009	TKK69248–5	HANDLE, HOLDER
M010	TLC2042–3	YOKE, CONVERGENCE
M011	TMM2A30202	WEDGE, DEFLECTION YOKE
M012	TQB510201–1	MANUAL, OWNERS'
M013	TXFKU1994SER	ASSY, COVER BACK
M014	TXFKY2494SER	ASSY, COVER METAL
M015	TXF3A03TLR	ASSY, DAG GROUND
M016	T8A262	SILCONE GREASE – HEAT SINK
M017	0FMK014ZZ	CONVERGENCE CORRECTOR STRIP
M018	**0SX110206X**	**AC LINE CORD**
M019	**37GDA85X(M)**	**CRT**

Ref. No.	Part No.	Description

ABBREVIATION OF PART NAME AND DESCRIPTION

RESISTOR

PART NAME & DESCRIPTION			
TYPE		ALLOWANCE	
C	Carbon	F	+/– 1%
F	Fuse	J	+/– 5%
M	Metal Oxide	K	+/– 10%
S	Solid	M	+/– 20%
W	Wire Wound	G	+/– 2%

Part No. **Description**

Example: ERD25TJ104 (C) 100KΩ (J) 1/4W

CAPACITOR

PART NAME & DESCRIPTION			
TYPE		ALLOWANCE	
C	Ceramic	C	+/– 0.25pF
E	Electrolytic	D	+/– 0.5pF
P	Polyester	F	+/– 1pF
S	Styrol	J	+/– 5%
T	Tantalum	K	+/– 10%
		L	+/– 15%
		M	+/– 20%
		P	+100% –0%
		Z	+80% –20%

Part No. **Description**

Example: ECKF1H103ZF (C) 0.01µF (Z) 50V

Matsushita Services Company
Division of Matsushita Consumer Electronics Company
A Unit of Matsushita Electric Corporation of America
50 Meadowland Parkway,
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95011120F0131

CT-S1390X


IC201 AN5265 AUDIO AMP
VIDEO/S-VIDEO SELECTOR
VIDEO/S-VIDEO CONTROL
IC5310 TVSTC4053BP
MULTI DECODER IC301 AN5163K
JK5303 TJS8A9040
JK5201 TJS6A8420
JK5203 TJS6A8420
JK5304 TJS8A9040
DELAY APATURE CIRCUIT
AUDIO VOLUME CONTROL
LINE A/B SELECTOR
IC001 MN152811HYG
MICRO-COMPUTER
IC002 PROM
IC102 AN78M09LB
IC551 AN78M10LB
IC552 AN78M05LB
IC451 LA7835-TV
V-OUT
V-SIZE
H-DRIVE
H-OUT
ERROR DET
PROTECT CIRCUIT
RELAY DRIVE
RESET
IC003 UPC2255HLB UPC2255HST
IC801 TVSSTR30130
HOT
COLD
R DRIVE
G DRIVE
B DRIVE
BUFFER
SPEAKER
TRANSFORMER
LINEA/LINEB
POWER
NORMAL
TINT DOWN
TINT UP
COLOR DOWN
COLOR UP
VOLUME DOWN
VOLUME UP
SHARPNESS DOWN
SHARPNESS UP
CONTRAST DOWN
CONTRAST UP
BRIGHTNESS DOWN
BRIGHTNESS UP
KEY INPUT 1
KEY INPUT 2
LED

CT-S1390Y CT-S1390Y

Exploded Views